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SOCIETY OF
BRITISH COLUMBIA

PROCEEDINGS

OF THE

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OF

BRITISH COLUMBIA

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To the Proceedings of the

British Columbia Entomological Society

APRIL, 1916

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1916

BRITISH COLUMBIA ENTOMOLOGICAL SOCIETY

Regular Annual Meeting, 1916

BUSINESS TRANSACTIONS.

The Fifteenth annual meeting of the Entomological Society of British Columbia was held in the Provincial Museum, Parliament Buildings, Victoria, B. C., on March 11th, 1916. Among those present were the following: Messrs. E. M. Anderson, J. R. Anderson, E. H. Blackmore, Dr. Seymour Hadwen, R. S. Sherman, Lionel E. Taylor, H. Thornber, R. C. Treherne, E. W. White, G. E. Wilkerson, Tom Wilson, W. Hugh, A. J. Crocker, G. E. Parham, A. G. Brown, W. Downes, D. Todd, J. A. Brydon, F. Kermode and several visitors.

The President, Mr. G. O. Day, Duncan, B.C., was unfortunately ill at the time of the meeting, hence was unable to occupy the chair

The Vice-President for the Coast, Mr. E. H. Blackmore, therefore was asked to open the meeting and to conduct the business of the Society and its proceedings.

Mr. Blackmore (Vice-President): I am very glad to accept the honour of presiding at this meeting. We are all sorry, and I am in particular, to hear of the indisposition of our President, Mr. Day, and we all sincerely hope he will soon recover. I am sure I am expressing the feelings of the Society as a whole when I say that we are fortunate in having such a President as Mr. Day. His work with the Society during the past three years has been of exceptional value, and we are indebted to him to a very large extent, for the excellent position and standing we are in as a Society.

Our Secretary, Mr. Treherne, is, I see, first on the programme, and will give us the business details that have engaged his attention during the past year and I fancy, that from his remarks you will gain an impression of the excellent position we are in. I will now ask our Secretary to bring up the first order of business.

Mr. Treherne (Secretary): The first order of business is placing this annual meeting in order. If you refer to our By-Laws you will see that our regular annual meeting should be held in January of each year. This ruling, however, we could not follow this year. I took the matter up with the Advisory Board, and received their unanimous consent to postpone the meeting until suitable. Hence a resolution placing this meeting in order would be the first item of business.

Resolved that this meeting be approved and considered in order. Movers —Parham, Sherman.—Carried.

The Secretary: The next item of business is that relative to the finances. I am pleased to say we are in excellent standing financially. I take pleasure in presenting the following statement. I have included a complete statement of the expenses of the Society from its resuscitation, in 1911, until the present, for reference.

FINANCIAL STATEMENT

December 9, 1911 (Reorganization Meeting)

	Credit.	Debtor.
1912.		
Members Subscriptions (Jan. 31, 1912)	$ 22.00	
Postage Stamps		$ 2.25
Post Cards		.10
Stationery		.90
Printing Programme		9.25
Janitor, Aberdeen School, Annual Meeting		3.50
Subscription to "Canadian Entomologist"		10.50
1913.		
Private Subscription Loan	60.00	
Members Subscription (Jan. 31, 1913)	70.00	
Printing Programme		9.25
Printing 1912 Report		115.00
Postage		8.75
Stationery		.60
Subscription to "Canadian Entomologist"		34.50
Engraving Map of B. C.		3.20
500 Copies of Map printed		2.25
Print of Photo Group		.75
Copper Plate of Group for Report		7.20
1914.		
Semi-Annual Meeting Expenses (Vernon)		15.00
Printing Circulars		10.25
Stationery		7.00
Subscriptions	55.00	
Provincial Government Grant	350.00	
Paying off Loan and Deficit (R.C.T.)		115.00
Semi-Annual Meeting, Expenses (Kelowna) (H.H.C.)		30.40
Printing Circular (Evans and Hastings)		4.00
Express, Stamps, Stationery, etc. (R.C.T.)		25.00
Electrical Fittings (Annual Meeting)		2.30
Lantern Slides		7.50
Engravings for Report		15.25
1915.		
Stenographer (Annual Meeting)		$ 10.00
Lantern Slides (Bishop and Christie)		9.05
Printing, Bulletin 5, (News Advertiser)		136.25
Provincial Government Grant	$250.00	
Arranging Library (G. H. U.)		6.00
Express, Stamps, etc. (R. C. T.)		8.00
Subscription to "Canadian Entomologist"		33.00
Subscriptions	66.00	
	$873.00	$642.00
Balance in Bank March 1st 1916	$231.00	
1916.		
Stenographer (Annual Meeting)		$ 11.00
Library Expenses (W. Hugh)		100.00
Express, $1.55; Freight, 68c; Stamps, $9.00; Stationery, $1.00; Janitor, $2.00; Typewriter Rent, $4.00; Mailing Bulletins $2.00 (R. C. T.)		20.23
Stenographer (letters re meeting)		6.54
Subscriptions to "Canadian Entomologist"		15.25
Printing Programmes (T. A. Hibben)		9.00
Members' Subscriptions (to date, April, 1916)	$19.00	
Engravings (Cleland and Dibble Engraving Co.)		38.00
To Stenographer, typewriting Syrphid paper		18.30
	$231.00	$218.32
Balance	$12.68	

MEMBERSHIP.

The membership during the past year has decreased from 90 to 66. It is probable that the membership will drop still further this year, owing in a great measure to the war situation. Approximately 15 of our members have joined the colours, and a number have withdrawn, owing partly to financial conditions and partly because the kind of information we are able to offer did not appeal to them.

I am glad to say, however, that a number of new members are joining; in fact, the general health of the Society is yearly improving, so far as entomological enthusiasts are concerned. As a Society, I think we should feel pleased that the membership is becoming more stable and the quality improving.

I regret to say, however, that we are in trouble with our parent Society in the East. It is probable that some of our members have not been receiving their publications for fee received, but I am taking steps now to see that the matter is cleared up; that back membership is settled, and that from now on we may make our situation clear with the Ontario Entomological Society. As I understand the situation, our Society here received its members and their dues during the first few months of the year. This list of members is then forwarded to Ontario with the enclosure of a sum of money equivalent to 50c per member. The following year our list of members, as the Society is in a formative condition, may change; new members are elected and some old members withdrawn. Hence the list forwarded to Ontario may vary from the previous list. So far as our Society goes, those members whose names are not included on the list are withdrawn, and no longer remain as members. However, as I understand the situation, this was not understood in Ontario. The "Canadian Entomologist" being run as a magazine, and therefore run on a different plan to our Society and other Branch Societies, maintains a continuous list of members. Therefore I believe the magazine has been sent to men who really are not on our list as members for the specific year, but were maintained on the Ontario list. As the list changes you can understand that some names have gone with arrears. It is not the fault of the members. It is a joint misunderstanding between myself, as Secretary to this Society, and Mr. A. W. Baker, Secretary of the Ontario Society.

In a recent letter covering these points, I have now made it clear how our Society is run, and that the list I file in the early part of each year following our Annual Meeting covers the members for that year, and all previous names are dropped. I have asked Mr. Baker to submit to me how many and what names are in arrears, and the extent of our obligation, and I trust that with your sympathy I shall be able to arrange matters from now on, on a satisfactory basis. It may mean the voting of $20, tentatively speaking, from our funds to refund the "Canadian Entomologist."

Mr. Treherne: If it is the wish of the members to take up this matter now, I will put it to the meeting, otherwise I will continue with other business. (Matter left over.)

THE LIBRARY.

I beg to submit a list of the books in our Library.

During the past summer I have been able to arrange the list of the books in our library. The library at the present time is at the Entomological Branch Laboratory, Agassiz. We have an upstairs space, which is devoted to the library. I have them arranged in cases, so that each bulletin is marked with blue pencil, the number corresponding to the list given here, so if anyone wishes any specific article he will be able to write for that number, and the Librarian will be able to go direct and mail it to him. Anybody who is working on any group, or wishes any book, can apply for it.

KEY TO CLASSIFICATION OF BULLETINS

Systematic

Lepidoptera, Nos. 1 to 54 inclusive.
Diptera, Nos. 55 to 81 inclusive.
Orthoptera, Nos. 82 to 99 inclusive.
Coleoptera, Nos. 100 to 111 inclusive.
Odonata, Nos. 111 to 121 inclusive.
Hymenoptera, Nos 122 to 176 inclusive.
Miscellaneous, Nos. 177 to 216 inclusive.

Economic

Nos. 217 to 344 inclusive.

SYSTEMATIC ENTOMOLOGY

1. Butterflies, Descriptions of New American. Schauss, W., 1902.
2. Butterflies, Three Interesting, from Massachusetts. Clark, Austin Hobart, 1913.
3. Campometra, Nocturnal Moths of. Smith, John B., 1899.
4. Cochlidiidae, Species of. Dyar, Harrison G., 1907.
5. Cochlidian Moths. Dyar, Harrison G., 1905.
6. Coenympha, American Species. Skinner, Henry, 1900.
7. Colorado, Moths from. Dyar, Harrison G., 1902.
8. Cosmopteryx Hubner, American Moths of. Busck, August, 1906.
9. Crambid Moths, N. American. Kearfott, W. D., 1908.
10. Depressaria Haworth, Genus. Busck, August, 1912.
11. Euerythra, species of. Smith, John B., 1887.
12. Gelechiidae, American Moths of. Busck, August, 1903.
13. Geometrid Moths, S. American. Warren, William, 1906.
14. Geometrid, Genus Pero, Studies of. Grossbeck, John A., 1910.
15. Geometrid Moths, Descriptions of genera and species. Warren, Wm., 1908.
16. Lepidoptera, from E. Africa, Kashmir. Holland, H. J., 1895.
17. Lepidoptera, of E. Africa. Holland, H. J., 1896.
18. Lepidoptera, of the Kootenai. Dyar, Harrison G., 1904.
19. Lepidoptera, Early Stages of Japanese. Dyar, Harrison G., 1905.
20. Lepidoptera, chiefly from Mexico. Dyar, Harrison G., 1912.
21. Lepidoptera, New Species from Mexico. Dyar, Harrison G., 1910.

21a. Lepidoptera, New Species Chiefly from Mexico. Dyar, Harrison G., 1913.

22. Lepidoptera of Panaman Canal Zone. Dyar, Harrison G., 1914.
23. Microlepidoptera, from Panama New Genera and Species. Busck, August, 1914.
24. Moths, N. American, Some Life Histories. Dyar, Harrison G., 1900.
25. Moths, S. American. Warren, William, 1905.
26. Noctuidae, on Pacific Coast of N. America. Grote. 1875.
27. Noctuidae, of N. America. Smith, John B., 1887.
28. Noctuidae, Revision of some Taeniocampid Genera. Smith, John B., 1889.
29. Noctuidae of Temperate N. America (incl. genus Agrotis). Smith, John B., 1890.
30. Noctuidae, Species of Hadena referable to Xylophasia and Luperina. Smith, John B., 1891.
31. Noctuidae, Geneva Cucullia, Dicopis, Xylomiges, and Morrisonia. Smith, John B., 1892.

32. Noctuidae. Smith, John B., 1894.
33. Noctuidae, Gen. Xylomiges, Xylina. Smith, John B., 1899.
34. Noctuidae, species Acontia. Smith, John B., 1900.
35. Noctuidae, Gen. Xylina. Smith, John B., 1900.
36. Noctuidae, A Hundred New Moths. Smith, John B., 1900.
37. Noctuidae, Spec. Mamestra. Smith, John B., 1901.
38. Noctuidae, Gen. Leucania. Smith, John B., 1902.
39. Noctuidae, some species hitherto referred to Genus Homoptera Boisduval. Smith, John B., 1908.
40. Noctuid Moths, Gen. Palindia and Dyomyx. Dyar, Harrison G., 1914.
41. Notodontidae. Neumoegen & Dyar, 1894.
42. Oecophoridae, Generic Revision of Family. Busck, August, 1908.
43. Saturnian Moths, Three New Species. Schauss, Wm., 1908.
44. Saturniid Moths, (larvae used as food by Indians). Aldrich, J. M., 1912.
45. Saturnian Moths in U. S. N. N. Dyar, Harrison G., 1913.
46 South American Moths. Dyar, Harrison G., 1905.
47. Syntomid Moths of S. Venezuela. Klages, Edward A., 1906.
48. Tineina, Superfamily, Moth of. Busck, August, 1900.
49. Tineid Moths from B. C. Busck, August, 1904.
50. Tineid Moths from S. Texas. Busck, August, 1906.
51. Tineid Moths, with Generic Table of Family Blastobasidae. Lord Walsingham, 1907.
52. Tineoid Moths, S. America, Descriptions of. 1911.
53. Tortricid Moths from N. Carolina. Kearfott, W. D., 1905.
54. Trichostibas, Genus, New Moths of. Busck, Aug., 1910.

DIPTERA

55. Agromyza, Flies of the Genus. Malloch, J. R., 1915.
56. Anthomyidae, Three New Species. Malloch, J. R., 1913.
57. Borboridae, New Species. Malloch, J. R., 1913.
58. Craneflies, sub. fam. Limnobinae. Alexander, Chas. P., 1913.
59. Diptera, Western. Osten Sacken, C. R., 1877.
60. Diptera, Japanese. Coquillet, D. W., 1898.
61. Dipterous Insects from Puerto Rico. Coquillet, D. W., 1900.
62. Diptera in the U. S. N. M. Coquillet, D. W., 1901.
63. Diptera from Southern Africa. Coquillet, D. W., 1901.
64. Diptera, Systematic Arrangment of Families. Coquillet, D. W., 1901.
65. Diptera; from North America. Coquillet, D. W., 1902.
66. Diptera, Type Species of N. American. Coquillet, D. W., 1910.
67. Dipterous Insects, One New Genus, Eight New Species. Malloch, J. R., 1912.
68. Diptera, Two New Species. Malloch, J. R., 1913.
69. Empidae, N. American. Coquillet, D. W., 1896.
70. Fannia, Notes on Genus. Malloch, J. R., 1913.
71. Mosquitoes, of Coast region of California. Dyar, Harrison G., 1907.
72. Mosquitoes, of Saskatchewan. Knab, Fred'k., 1908.
73. Mosquitoes, from Tropical America. Dyar & Knab, 1908.
74. Mosquito Fauna of Panama. Busck, August, 1908.
75. Mosquitoes, American (New Species). Dyar & Knab, 1909.
76. Muscoid Flies, from Pacific Coast. Townsend, Chas. H. T., 1912.
77. Pipunculidae, Insects of the Family. Malloch, J. R., 1912.
78. Ptychopteridae, Revision of. Alexander, Chas. P., 1913.
79. Psychodidae (Moth-Flies). Knab, Fred'k., 1913.
80. Pseudodinia, Notes on Genus. Malloch, J. R., 1915.
81. Tabanidae (Gad-Flies) Gen. Stibasoma. Knab, Fred'k., 1913.

ORTHOPTERA

82. Acrididae, Found North of Mexican Boundary. Bruner, Lawrence, 1889.
83. Acrididae, Paraguayan, Synoptic List. Bruner, Lawrence, 1906.
84. Acridiidae, Two Neotroprical Species. Rehn, Jas. A. G., 1908.
85. Acridiidae, Yale Peruvian Expedition. Bruner, Lawrence, 1913.
86. Acridiidae, Addenda to 86. Bruner, Lawrence, 1913.
87. Forbiculids and Blattids (Old World). Rehn, Jas. A. G., 1904.
88. Grasshoppers, Subf. Acridinae. Rehn, Jas. A. G., 1906.
89. Grasshopers, Brazilian. Rehn, Jas. A. G., 1909.
90. Katydids, Three New Species, and Crickets from Costa Rica. Rehn, Jas. A. G., 1906.
91. Locustidae and Gryllidae (Paraguay). Caudell, Andrew Nelson, 1906.
92. Mantids, Studies in. Rehn, Jas. A. G., 1904.
93. Orthoptera, Two from U. S. Caudell, A. N., 1904.
94. Orthoptera, from S. Arizona. Caudell, A. N., 1905.
95. Orthoptera, Notes on Western. Caudell, A. N., 1908.
96. Orthoptera, African—Mantidae & Phasmidae. Rehn, Jas. A. G., 1912.
97. Orthopterous Insects, Nearctic. Caudell, A. N., 1913.
98. Orthoptera (Exel. Acrididae). Caudell, A. N., 1913.
99. Protoblattid, from lower Cretaceous. Evelyn Groebeck Mitchell, 1908.

COLEOPTERA

100. Barkbeetles, Genus Dendroctonus. Hopkins, A. D., 1909.
101. Cerambycidae and Scarabeidae. Linell, Martin L., 1896.
102. Chrysomelidae. Linell, Martin L., 1897.
103. Coleopterous Insects, Galapagos Is. Linell, Martin L., 1898.
105. Coleoptera, Fossil from Florissant. Wickham, H. F., 1913.
106. Curculionid Beetles, Tribe Anthonomini. Dwight Pierce, W., 1908.
107. Powder-Post Beetles, Fam. Lyctidae. Kraus, E. J., 1911.
108. Scarabeidae, N. American. Linell, Martin L., 1896.
109. Scolytid Beetles, Synonymy. Eichhoff, Wm., 1896.
110. Weevils, Studies of N. American. Dwight Pierce, W., 1909.
111. Weevils, Some of Economic or Biologic Importance. Dwight Pierce, W., 1912.

ODONATA

112. Dragon Fly Nymphs in U. S. N. M. Needham, Jas. G., 1904.
113. Dragon-Flies of Burma, Subf. Calopteryginae. Williamson, Edward B., 1904.
114. Dragonflies of Burma & Lower Siam, Subfamilies, Cordulegasterinae, Chlorogomphinae and Gomphinae. Williamson, E. B., 1907.
115. Dragon-Flies of Mississippi Valley. Wilson, C. B., 1907.
116. Dragon-Flies of Kentucky and Tennessee. Wilson, C. B., 1912.
117. Odonata, E. Africa. Calvert, Philip P., 1895.
118. Odonata, E. Africa. Calvert, Philip P., 1895.
119. Odonata, Genus Macromia. Williamson, Edward B., 1909.
120. Odonata, Bumping Lake, Washington, Kennedy, C. H., 1913.
121. Wing Venation, Genealogic Study. Needham, J. G., 1903.

HYMENOPTERA

122. Augochlora, Genus, West Indies. Cockerell, T. D. A., 1910.
123. Bees in U. S. N. M., Some Descriptions. Cockerell, T. D. A., 1909.
124. Bees, in U. S. N. M., 1. Cockerell, T. D. A., 1911.
125. Bees, in U. S. N. M., 2. Cockerell, T. D. A., 1911.

126. Bees, Eucerine, Names applied to. Cockerell, T. D. A., 1912.
127. Bees, Genera, Lithurgus, Anthidium & allies. Cockerell, T. D. A.
128. Braconidae, in U. S. N. M. Ashmead, W. H., 1888.
129. Encyrtinae, Insects of, with branched antennae. Howard, L. O., 1892.
130. Hymenoptera, from Philippine Islands. Ashmead, W. H., 1904.
131. Hymenoptera, from Philippines. Ashmead, W. H., 1905.
132. Hymenoptera, from Philippines (additions). Ashmead, W. H., 1905.
133. Hymenoptera, (new) from Philippines. Ashmead, W. H., 1905.
134. Hymenoptera, from Japana. Ashmead, W. H., 1906.
135. Hymenoptera, from Philippines. Crawford, J. C., 1910.
136. Hymenopterous Insects, from Philippines. Rohwer, S. A., 1910.
137. Hymenopterous Insects, from Formosa. Rohwer, S. A., 1911.
138. Hymenoptera, Descriptions of New, (1). Crawford, J. C., 1911.
139. Hymenoptera, Descriptions of New, (2). Crawford, J. C., 1911.
140. Hymenoptera, Descriptions of New, (3). Crawford, J. C., 1911.
141. Hymenoptera, Descriptions of New, (4). Crawford, J. C., 1912.
142. Hymenoptera, Descriptions of New, (5). Crawford, J. C., 1912.
143. Hymenoptera, Descriptions of New, (8). Crawford, J. C., 1913.
144. Hymenoptera, from N. America. Gahan, A. B., 1913.
145. Hymenoptera, Superf. Apoidae & Chalcidoidae. Crawford, J. C.
146. Ichneumonidae, from Pacific Slope. E. T. Cresson, 1878.
147. Ichneumonidae, in U. S. N. M. Ashmead, W. H., 1890.
148. Ichneumon Flies, Descriptions. Viereck, H. L., 1910.
149. Ichneumon Flies, reared, Species of. Viereck, H. L., 1911.
150. Ichneumon Flies, Descriptions. Viereck, H. L., 1911.
151. Ichneumon Flies, Descriptions. Viereck, H. L., 1911.
152. Ichneumon Flies, Descriptions. Viereck, H. L., 1911.
153. Ichneumon Flies, Descriptions. Viereck, H. L., 1912.
154. Ichneumon Flies and Bees. Viereck, H. L., 1912.
155. Ichneumon Flies, Descriptions. Viereck, H. L., 1912.
156. Ichneumon Flies, Descriptions. Viereck, H. L., 1913.
157. Ichneumon Flies, Descriptions. Viereck, H. L., 1913.
158. Ichneumon Flies, Descriptions. Viereck, H. L., 1913.
159. Ichneumonoidea, Yale Peruvian Expedition. Viereck, H. L., 1913.
160. Nomada, Genus of Bees in N. America. Cockerell, T. A., 1911.
161. Nomia, N. American Bees of Genus. Cockerell, T. D. A., 1910.
162. Osmia, Names applies to Genus. Cockerell, T. D. A., 1912.
163. Parasitic Hymenoptera from Ceylon. Howard and Ashmead, 1896.
164. Parasitic Hymenoptera, S. America. Crawford, J. C., 1910.
165. Parasitic Hymenoptera, Erixestus, Plagiomerus, Psylledontus. Crawford, J. C., 1910.
166. Parasitic Hymenoptera, Gen. Eiphosoma. Cockerell, T. D. A., 1913.
167. Sawflies, Japanese. Rohwer, S. A., 1910.
168. Sawflies, in U. S. N. M. Rohwer, S. A., 1911.
169. Sawflies, Descriptions. Rohwer, S. A., 1912.
170. Tenthredinidae, Japanese. Marlatt, C. L., 1898.
171. Tenthredidnoidea, from Eastern Canada. Rohwer, S. A., 1910.
172. Vespoidea and Sphecoidea. Rohwer, S. A., 1913.
173. Wasps, Descriptions of New Species. Rohwer, S. A., 1911.
174. Wasps, Fam. Sphecidae. Fernald, Henry T., 1912.
175. Wasps, Descriptions. Rohwer, S. A., 1912.
176. Wasps, Superfamily Orysoidea. Rohwer, S. A., 1912.

GENERAL

177. Animals and Plants from Colorado (described as new). Cockerell, T. D. A., 1912.
178. Anthrax. Coquillet, D. W., 1892.
179. Asilidae. Williston, S. W., 1885.
180. Bark-Weevils, Genus Pissodes. Hopkins, A. D., 1911.
181. Bees, Rocky Mountain. Cockerell & Robbins, 1910.
182. Bees, New Mexico. Cockerell, T. D. A., 1898.
183. Bees, of Boulder County, Colorado. Cockerell, T. D. A., 1907.
184. Bees, Some in Harvard Univ. Museum. Cockerell, T. D. A., 1907.
185. Bombylidae. Coquillet, D. W., 1894.
186. Coleoptera and other Insects (coll. by Dr. Abbott). Linell, Martin L., 1897.
187. Cycadoidea (Fossil). Ward, Lester F., 1898.
187a. Callimorpha Latr. Smith, John B., 1887.
188. Dermaptera, of the U. S. N. M. Burr, of Malcolm, 1910.
189. Forficalids (Earwigs). Rehn, Jas. A. G., 1905.
190. Fossil Insects from Florissant. Cockerell, T. D. A., 1913.
191. Geological Survey of Canada. Robert Bell, 1903.
192. Ixodoidea (Ticks). Banks, Nathan, 1908.
193. Kansas University Science Bulletin, 1905.
194. Millipeds, in S. Texas. Cook, O. F., 1911.
195. Millipeds, Order Merocheta, Tropical. Cook, O. F.
196. Myriapods, Fam. Lithobudae, Utah. Chamberlin, Ralph V., 1901.
197. Natural History of Rocky Mountains. Cockerell, T. D. A., 1905.
198. Nearctic Spiders, Catalogue of. Banks, Nathan, 1910.
199. Noctuidae, California. Grote, A. R. (Art. VI., U. S. Geo. Survey.)
200. Odonata of Ohio, Catalogue of. Kellicott, D. S., 1896.
201. Papilio Machaon. Edwards, W. H., 1883.
202. Sawflies (Chalastogastra) Boulder Co., Colorado. Rohwer, Sievert A., 1912.
203. Spiders and other Arachnida, Southern Arizona. Banks, Nathan, 1901.
204. Spiders and other Arachnida, Porto Rico. Banks, Nathan, 1901.
205. Spiders, from Arizona. Banks, Nathan, 1902.
206. Streptisiptera. Dwight Pierce, W., 1911.
207. Syrphus arcuatus Fallen. Osburn, R. C., 1910.
208. Syrphus perplexus. Osburn, R. C., 1910.
209. Syrphidae, Genus Scaeva (Catabomba) Invalidity. Osburn, R. C., 1910.
210. Tachinidae, Revision. Coquillet, D. W., 1897.
211. Tenebrionid, Genus, Echocerus. Chittenden, F. H., 1895.
212. Tertiary Insects. Cockerell, T. D. A., 1908.
213. Tenthredinoidea, Genotypes of. Rohwer, S. A., 1911.
214. Thysanopterous Insects, Barbados. Franklin, Henry Jas., 1908.
215. Thorax, of Insects & Articulation of Wings. Snodgrass, Robt. Evans, 1909.
216. Tomocerinae, Sub. Fam. of Spring-tails. Folsom, Justus W.

ECONOMIC ENTOMOLOGY

217. Alfalfa Caterpillar. Wildermuth, V. L., 1911.
218. Apples, Spraying. Bull. 191. Ohio Ag. Expt. Stn., 1908
219. Apple Spraying in 1908. H. A. Gossard, Ohio Ag. Stn., 1909.
220. Apple Tree Insects of Maine. Maine Ag. Expt. Stn., 1909.
221. Apple Leaf Hopper and others. Washburn, F. L., 1909.

222. Bacterial Blight, Apple, Pear, Quince (Bull. 176). D. H. Jones, Ont. Dep. Ag, 1909.
223. Bark Beetles or Bark Borers. Gossard, H. A., 1908.
224. Bee Diseases in Ontario (Bull. 197). Pettit, Morley, Ont. Dep. Ag., 1912.
225. Bee Diseases in Ontario. Bull. 190, Ont. Dep. Ag., 1911.
226. Bee Diseases in Ontario. Pettit, Morley (Rev. Ed., No. 197), 1913.
227. Boll Weevil, Most Important Step in Control. Hunter, W. D., 1907.
228. Boll Weevil, Bibliography. Bishopp, F. C., 1911.
229. Boll Weevil, Hibernation in Central Louisiana. Circ. 31, State Crop Pest Commission, civ, 1909.
230. Boll Weevils, Destroying before Hibernation. Circ. 24, State Crop Pest Co., 1908.
231. Boll Weevil, Reducing Number during June and July. Circ. 22, S. C. P. C., 1908.
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NOTE.—There are a few more volumes and papers in our possession that are not in the above list; these will be recorded in a later list. Members are requested to send in any volumes, papers or books, they have no particular use for, of an Entomological nature, to complete and fill up series, etc.

WILLIAMS HUGH,
316 Beckley Ave., Victoria, B.C.

I had an opportunity of returning East this winter, and one of the points I took up was the utilizing of the library at Guelph. They have a very large and well equipped library there. Mr. Winn, who is President of the Montreal Branch, and President of the parent Society for this year, understands the situation of branch societies. We are not like the members at Guelph, who have the library within 100 yards of them. We are many miles away, consequently we are not able to get the books so readily. I am able to say now, that all the members of any branch Society are able to write to Guelph and obtain books from that library. Postage to and from will have to be paid at our end. They have also a very excellent library at Montreal, the property of the late H. H. Lyman. Mr. Winn has charge of this library, but is not allowed to circulate books. He will, however, take extracts, and will forward these at the request of our members. Therefore, supposing you wish to get an extract from Volume 26, No. 2, of the "Canadian Entomologist," a reference which your work has made you refer to, you will be able to write to Mr. Winn for that reference, which will be written out for you and mailed. Mr. Winn's address is 36 Springfield Avenue, West Mount, Montreal, P.Q.

I would suggest therefore, that we devote $100.00 of our money to the purchasing of books for our library; Thus, any member who is working on any special group of insects, if he wishes to obtain some book which costs a sum of money, which he does not feel like expending himself, will be able to use this money for purchasing the paper required. The President, Secretary and Assistant Secretary, who might act as Librarian, will decide whether or not it is advisable to purchase the book or paper. It will be one of our books, and will remain the property of the Society, but it may be held by a member for such time as he has use for it. When he has dispensed with its service he can return it to the library. I bring this up now as a suggestion, but later will frame a resolution covering the point.

Any matter dealing with the Library and the obtaining of books or circulars is to be addressed to Williams Hugh, 316 Beckley Avenue, Victoria, B. C.

THE PUBLICATIONS.

Doubtless in the minds of many of you there is some question as to how our Bulletins are being issued. Through the kindness of the Department of Agriculture, we have been able to have our bulletins printed by the Govern-

ment press. Nos. 3, 7 and part of 4 were authorised by the Department of Agriculture. Bulletin No. 6 and part of No. 4 were issued, thanks to the representation made to the Department of Education by Mr. Francis Kermode. Bulletins Nos. 1, 2 and 5 were issued at the expense of the Society.

It may appear strange to you that our bulletins are being authorised from these different sources. In explanation, therefore, I wish to recall to your memory how our Society re-organized. In December, 1911, I called a meeting in Vancouver, and resuscitated the Society, which had been dormant for several years. The proceedings of this meeting were printed in Bulletin No. 1, at the private expense of a few members. It was very unpretentious, but a start. On January 9th, 1913, a second meeting was held, and the proceedings were issued in Bulletin No. 2 at our own expense. At that meeting it was decided to hold a semi-annual meeting in the Okanagan during the summer. This meeting was duly held in Vernon on July 18th and 19th, 1913. The object of this meeting, as evidenced by the character of the papers submitted, was mainly economic in nature. I therefore presented my case to the Department of Agriculture, Victoria, B. C., submitting the papers read at this Vernon meeting, and presenting and explaining the character of our work, as evidenced by our former publications, Nos. 1 and 2. Through the kindness of the Hon. Price Ellison, Minister of Agriculture, and Mr. W. E. Scott, Deputy Minister of Agriculture, I was accorded the pleasure of having Bulletin No. 3 passed through the Government press free of charge to the Society. I was further able to procure a grant of money for the Society, which relieved the Society of its indebtedness incurred by the two previous publications. You will notice, in this connection, that we had to abide by the regulation size of paper and type of print, required by Departmental bulletins. This, of course, we were very pleased to do, considering the courtesy with which our claims were met.

Our fourth meeting, or the thirteenth Annual Meeting since the inception in 1902, was held in Victoria on January 23rd, 24th, 1914. At this meeting, as may be gathered by the papers presented, we had a combination of scientific and popular economic papers. On submitting the papers to the Department of Agriculture on the request to again have them printed by the Government press, I was met by the objection that many of the papers were too technical for the farmer, and hence the Department could not see their way clear to authorize the printing of the whole. They were willing, however, to sanction the printing of those of economic interest. Consequently, in Bulletin 4, of our Series, from page 1 to 39, we find the economic papers issued. It became necessary at this point to make arrangements for the publications of the Scientific Technical papers. I presented my case to Mr. Francis Kermode, Director of the Provincial Museum, and he in turn referred the matter to Dr. H. E. Young, Minister of Education, and I was able to follow this up by personal representation. I was able, therefore, to obtain authorization to have the technical papers printed. I cannot here say how much this Society should feel indebted to Mr. Kermode for his very kindly help and assistance, both in this instance and later. He has continually placed his services at our disposal, and has at all times supported our endeavours. I trust this Society will remember this, and will take steps to give Mr. Kermode an appreciation in return for his kindly and ready help.

As it happened, the proceedings of our 13th Annual Meeting went to press in two sections, authorized on the one hand by the Department of Agriculture, and on the other hand by the Department of Education. Mr. W. H. Cullen, King's Printer, asked me by letter whether it would be suitable to combine the two proceedings as one bulletin. I replied in the affirmative, hence you have Bulletin No. 4 in combination.

The success of the first semi-annual meeting was so marked that it was decided to hold a second. This meeting was held at Kelowna on August 20th, 1914. The fourteenth annual meeting was held in Vancouver on January 16th, 1915. The papers presented at these two meetings were combined and submitted for publication. In view of the previous objection raised, it was thought advisable that we separate our economic papers from our systematic, and from this point on run two series in our publications.

In order to set a standard in type of print thought desirable for scientific literature, I made arrangements to issue at our own expense, Bulletin No. 5.

The numbering of the pages in Bulletin No. 5 runs consecutively with Bulletin No. 4. The type of printing, as you will observe, is a wide difference from previous issues, and in my opinion much more suitable for scientific literature. I may say that Bulletin No. 5 created a most favourable impression in the Entomological world. The remaining papers presented at the two meetings, i. e., Kelowna and Vancouver, still required publication. I separated the technical from the economic, submitting the former to Mr. Kermode, who authorized its publication as Bulletin No. 6. The latter was submitted to the Department of Agriculture, who authorized its publication as Bulletin No. 7. The type used in the printing of these two bulletins differs, as can be seen. It was necessary to make arrangements with the King's Printer in regard to the change of type, as it appeared there was some di....culty in changing type to suit our Bulletin No. 5. However, I am pleased to say this was overcome, and we have Bulletin No. 6 running in consecutive order with Bulletin No. 5, as the "Technical or Systematic Series." The numbering of the pages in Bulletin No. 7 commences at 1, hence with Bulletin No. 7 we start a new series called the "Economic Series."

I think it advisable that our future publications should run in these two series, and the pages should run consecutively, so that after a period of time an index could be drawn up covering the former issues. I trust this explanation is clear, and in accordance with your wishes. I will submit for your approval a resolution covering this point, later.

Resolved That the Secretary's Report be adopted. Movers: Hugh—Wilson. Carried.

RESOLUTIONS.

During the session the following resolutions were discussed and acted upon:

1. Re BIRDS.

In view of the fact that a great deal of discussion commonly occurs at Farmer's meeting in regard to the usefulness or destructiveness of birds in their relation to agriculture, and considering the fact that from many standpoints the relation of birds to agriculture has an Entomological bearing,

Be it Resolved: "That this Society being the Entomological Society of British Columbia urge the Provincial Government to undertake an investigation into the food and habits of birds in relation to their economic value, and that the Government be asked to publish a bulletin dealing with the economic value of the common birds in British Columbia."

Movers: Taylor—Parham. Carried.

2. Re PARENT SOCIETY.

In view of a misunderstanding that has occurred between this Society and the Parent Society in the matter of membership dues

Be it Resolved: That the Secretary be authorized to straighten up the affairs of this Society with the parent Society, and that he be authorized to utilize such funds of the Society to accomplish this end.

Movers: Treherne—Wilson. Carried.

3. Re BY-LAWS.

In as much as the By-Laws of the Society call for the regular annual meeting to be held in January of each year, and as this is not always convenient,

Be it Resolved That the words "In the Spring" replace the words "In the month of January" in the By-Laws covering the date of meeting.

Movers: Treherne—Wilson. Carried.

4. Re SOLDIER'S FEES.

In consideration of the fact that several of the members of the Society who have joined the colours and enlisted for military service in Europe, desire still to retain their membership,

Be it Resolved "That the Secretary be authorized to forward the dues (50c) per member to the 'Canadian Entomologist' for every member of the Society who have joined the army and that the money be made available from the funds of the Society."

Movers: Treherne—Downes. Carried.

5. Re NOTES OF CONDOLENCE.

In consideration of the loss, during the past year, the Society has sustained by the death of Mr. Thomas Cunningham, late Provincial Inspector of Fruit Pests; of Mr. E. H. Robinson, beekeeper, Victoria; and of Capt. R. V. Harvey, formerly Secretary of the Society, who was wounded on active service in France, and died in a German prison,

Be it Resolved "That the Secretary be authorized to send the dependents of Mr. Thomas Cunningham, Mr. E. H. Robinson, and Capt. R. V. Harvey, the heartfelt condolence of the Society, and a recognition of the services they performed, not only for the Society, but also for the Province as a whole.

Movers respectively: Treherne—Wilson; Todd—Blackmore; Sherman—Treherne. Carried.

6. Re GRANT TO LIBRARY.

In consideration of the fact that it is advisable not only to build up our library by the purchase of books of reference, but also to assist members in studying groups of insects in which they are interested,

Be it Resolved "That ($100) One Hundred Dollars of the funds of the Society be placed towards the furtherance of building up the library and supplying the members with books of reference, and that the President and Secretaries, be appointed to decide and act on each request in accordance with the best interests of the Society.

Movers: Treherne—Wilson. Carried.

7. Re SEMI-ANNUAL MEETING.

In consideration of the success of former summer semi-annual meetings,

Be it Resolved "That a semi-annual meeting be held at Penticton during 1916."

Movers: Treherne—Wilson. Carried.

8. Re PROVINCIAL MUSEUM.

In consideration of the courtesy and kindly help the Society have always experienced at the hands of the Provincial Museum, through the medium of Mr. Francis Kermode, Director of the Museum,

Be it Resolved: "That the Society tender its thanks to Mr. F. Kermode for the use of the room to hold the meetings in, and also for the assistance and support in the publication of its technical papers it has received."

Movers: Treherne—Sherman. Carried.

9. Re PROVINCIAL DEPARTMENT AGRICULTURE.

In consideration of the many kindly services accorded the Society by the Minister of Agriculture, and by Mr. W. E. Scott, Deputy Minister of Agriculture,

Be it Resolved: "That this Society express its deep appreciation to the Provincial Department of Agriculture for obtaining the Society a grant ($250.00) for maintenance and for the assistance and support it has received in issuing the "Proceedings."

Movers: Blackmore—Wilson. Carried.

10. Re B. C. LIST OF INSECTS.

In consideration of the necessity of publishing a B. C. List of Insects, the members are requested to compile and work out the names of determined species of insects known to occur in British Columbia.

Be it Resolved "That the list of insects in B. C. be published as soon as possible, and that the matter be dealt with by the Advisory Board." Carried.

GENERAL DISCUSSION.

A general discussion on these foregoing resolutions, and on other matters of interest took place during the session. The remarks passed were somewhat as follows:—

Mr. Sherman: I wish to express, on behalf of the Society, and for myself in particular, great sorrow at the death of Capt. R. V. Harvey. I am sure that all the older members of the Society are well acquainted with Capt. Harvey and his work. We regard his loss as that of a personal friend. He may be regarded as the founder of this Society and has personally inspired many young members with the desire to do good work. He was always willing to assist more humble searchers after truth, and, I may say without hesitation, that in the various lines of Entomology he took up, he excelled. He was one of our best authorities in the West, and a most enthusiastic collector. He took up the study of the Diptera and was enthusiastic about that group. He added many new species to our list. Although he was not very active, as an Entomologist, during more recent years, yet while he was active, he represented the old type of Entomologist and studied the subject from pure love of the science, and not for anything he might get out of it personally. He was a man who was both friend and companion, and his loss is a severe one to a society such as this and, on account of his personal nature, a great loss to humanity.

Mr. Treherne: In moving a note of condolence to our late friend, Mr. Thomas Cunningham, who until so recently held an honoured position in this Province as Inspector of Fruit Pests, I would like merely to say, that I feel a great personal loss in his recent decease. We had all met him, as he has attended these meetings of ours for the past three years. We all recognized, none more so than those who worked in close co-operation with him, the earnest way he had when dealing with matters of Provincial interest, and all his actions were guided by the sincere wish to do the best he knew how for the welfare of the Province.

Mr. Wilson: A word to support Mr. Treherne's remarks. We have lost, in the death of Mr. Cunningham, a very valuable man and a time honoured servant of the Province. The horticultural interests have also suffered a severe loss by his death. Some times he and I did not see "eye to eye" and our views were often antagonistic to one another, but I wish to say that I have always held a sincere respect for Mr. Cunningham for the forcefulness of his character. The love he held for this great and grand Province of ours far exceeded the love he held for anything else. He will be sorely missed by the fruit growers and farmers; he will be missed generally.

Mr. Blackmore: The beekeepers of British Columbia have lost just as big a friend in their line as have the horticulturists in theirs, in the recent death of Mr. E. H. Robinson. Mr. Robinson was one of the best beekeepers we have ever had in British Columbia. He was fearless, genuine, and always spoke what he thought. I have known him for several years, and I have heard him remark often what he proposed to do for this meeting, and for this Society. Now he has gone, his loss will be felt no less so than for the other two gentlemen you have just mentioned.

Mr. Dundas Todd: I am very glad, indeed you have carried a resolution of condolence with Mrs. E. H. Robinson, regarding the death of her husband. Mr. Robinson was the best beekeeper in this part of the world. He took a great interest in beekeeping. I have had several letters regarding the conditions in his Apiary. He was a first-class workman, and a first-class bee-man, and I am glad to have this opportunity of adding my testimony to what has already been said.

Re CANADIAN ENTOMOLOGIST.

Mr. Treherne: There is another matter I would like to hear discussed, and that is the advisability of sending back some of our papers to be published in the "Canadian Entomologist." You all know, and it is emphasized in the paper by Mr. Winn, that the number of articles penned by Canadians appearing in its pages is not nearly high enough. I would like to suggest that we send back some of our papers presented at this meeting for the "Canadian Entomologist" for publication with the words attached to the article: "Con-

tributions from the Entomological Society of British Columbia." In this way we would be aiding the oldest journal of Canadian Entomology, and the circulation and notoriety such an article would receive would far exceed the notoriety our Society can give for many years. The kudos this Society would gain would be accomplished by adding the postscript I suggest. There are at least four of the papers submitted at this meeting which could and would be readily acceptable in the pages of the "Canadian Entomologist." The other papers, being of peculiar interest to the Province, can better be taken care of out here. I bring this matter up for discussion.

A Member: I am inclined to think that the style of the "Canadian Entomologist" might be improved considerably.

Mr. Sherman: Contributions to the "Entomologist" might be left to the individual contributors. So long as we are able to publish our own proceedings, I am in favour that we do so.

Mr. Blackmore: Mr. Kermode has in the past, and we hope will in the future, have our publications of scientific interest published by the Government press with his consent and support. So far as the papers of economic interest are concerned, Mr. Treherne has thus far been able to obtain the support and co-operation of the Department of Agriculture.

Mr. Kermode: I am sure I am perfectly willing to do what I can to assist in having your technical papers published under the Museum Department.

Mr. Treherne: I am sure we all feel very much indebted to Mr. Kermode of his kind services, and our appreciation should also extend to Mr. W. E. Scott, Deputy Minister of Agriculture, however, I think it only right and proper that the members of this Society should realize that, as a private Society, we are obtaining these services by the grace and goodness of these various departmental chiefs. It must never be thought for a moment that the kindness extended to us, as a Society thus far, is to act a precedent, and that if the auspices were not good and we were unable to obtain former assistance in the matter of printing or by grant, we should feel hurt or misused. It must be clearly understood that, at the moment, we are a private Society, operating under a grant and assisted by the Department press, and that we can only hope for maintenance of this principle provided we are able to show how and why and where we are of a benefit to the Province. I think we have shown this, and will do so more as time goes on, but we must not be confused in first principles.

Mr. Blackmore: I think we had better handle our own papers, as long as we are able to. I notice that the names of Eastern Canadians do not appear as often as they might in the pages of the "Entomologist." I am inclined to think that, proportionately speaking, the West is well represented in the pages of the magazine, and that we have our own bulletins in addition. I think it would be a mistake to send papers to be printed there, and not have the benefit of their being printed here, as they refer to British Columbia insects.

At the wish of the meeting the matter was allowed to drop, no steps being taken to publish in the East.

OFFICERS, 1916.

The following officers for the Society for the year March, 1916 and Spring, 1917, were regularly elected.

Honorary President.....Francis Kermode
President.....E. H. Blackmore
1st Vice-President (Okanagan).....Lionel E. Taylor
2nd Vice-President (Coast).....R. S. Sherman
Secretary-Treasurer.....R. C. Treherne
Asst. Secretary and Librarian.....W. Hugh
Advisory Board.....Messrs. Blackmore, Taylor, Sherman, Treherne, Hugh, G. O. Day, Tom Wilson, E. M. Anderson.

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French, P. E. ..... Salmon Arm
Gavet, D. ..... Court House, Vancouver
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Ward, W. E. ..... Freight Office C. P. R., Vancouver
Warren, Miss E. ..... Barston Island

COMPLIMENTARY MAILING LIST

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The MARK of GOOD PRINTING

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY

OF

BRITISH COLUMBIA

MARCH 1916
NUMBER 8
SYSTEMATIC SERIES

VICTORIA, B. C.:
PRINTED BY THE COLONIST PRINTING AND PUBLISHING CO., LTD.

1918

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BRITISH COLUMBIA ENTOMOLOGICAL SOCIETY

PROCEEDINGS, 1916

The Fifteenth Annual Meeting of the Entomological Society of British Columbia was held on March 11th, 1916, in the Provincial Museum, Victoria, B.C.

Owing to the absence through illness of the President, Mr. G. O. Day, of Duncan, the chair was occupied by the Vice-President, Mr. E. H. Blackmore, who called the meeting to order at 9 a.m.

The report of the Secretary-Treasurer, showing the continued satisfactory progress of the Society and its healthy financial condition, was moved and adopted.

Seventeen papers were read, including six on systematic subjects and eight of economic importance. The economic papers were printed in Bulletin No. 7 (Economic Series), while the chief of the systematic papers are published in this present Bulletin No. 8 (Systematic Series).

At the close of the day's proceedings the election of officers for the year 1916 was proceeded with, and resulted as follows:

Hon. President—F. Kermode, Provincial Museum, Victoria, B.C.

President—E. H. Blackmore, Victoria, B.C.

Vice-President (Coast)—R. S. Sherman, Vancouver, B.C.

Vice-President (Interior)—L. E. Taylor, F.Z.S., Vernon, B.C.

Secretary-Treasurer—R. C. Treherne, B.S.A., Agassiz, B.C.

Assistant Secretary—Williams Hugh, Victoria, B.C.

Advisory Board—E. M. Anderson, Victoria, B.C., Tom Wilson, Vancouver, B.C., in addition to the officers above mentioned.

PRESIDENTIAL ADDRESS

By G. O. Day, F.E.S., Duncan, B.C.

The shadow of the dreadful war in which the Empire is engaged is still over us. The past year has been filled with anxiety and gloom. Almost all of us have friends or relations who have been or are taking part in the terrible strife; and I think I am expressing the general feeling when I state there has been a sense of suspense and unrest and of dread as to what each day might bring forth. Is it indeed to be wondered at, therefore, if people have felt too uneasy over the stupendous struggle in Europe to give full-hearted attention to the special subject our Society is interested in? I rather think it is a matter for congratulation that we have done so well, especially in the programme provided for today, in the matter of papers.

The awfulness of war has been brought very closely home to us by the death of one of our members—Capt. R. V. Harvey. He was wounded and taken prisoner at Festubert in April last, and subsequently died in Germany from his wounds. Though of late years he had not done much active work in Entomology, he it was who was mainly instrumental in starting the B.C. Entomological Society in 1902; and from the quarterly bulletins issued during the years 1906-07-08 (copies of which are preserved in our library), we have evidence of what an energetic Secretary and enthusiastic entomologist he was at that time.

I would like to express our appreciation of the sacrifice of his life in the cause of the Empire and our sense of the loss the Society has sustained by his death.

It is with much regret that I have to refer to the losses by death of two other members of the Society. These are Mr. T. Cunningham (quite recently) and Mr. E. H. Robinson (last year). Mr. Robinson was an authority on Honey Bees. He attended our Annual Meeting two years ago and gave us a talk about those insects—with particular reference to the new disease affecting them.

Mr. Cunningham was a keen supporter of our Society, chiefly, of course, on the economic side. Those who knew him personally must admire his staunch character and appreciate the whole-hearted devotion in which he carried out his duties as Fruit Inspector for the Province.

In considering a general review of Entomology during the past year, very few important events have come under my observation.

The meeting of the International Congress of Entomology, which was due to be held in 1915, did not—obviously could not—take place.

Our parent Society, the Entomological Society of Ontario, published during the year a most satisfactory report containing interesting papers and addresses. In the Presidential address by Dr. Hewitt particular

mention is made of the gratifying development of the British Columbia Branch of the Society. A reference to the list of members certainly gives us cause to be proud of our position—numerically at all events—for the Province of British Columbia furnishes 98 members out of a total of 203 for the whole of Canada; that is, nearly half the number.

Our neighbours across the line, being not so much affected by war conditions as ourselves, held, as you know, a monster Exposition at San Francisco during the summer. The Entomological Society of America took advantage of this event to hold a Convention there, which entomologists from all over the United States and some from Canada attended. The arrangements were on a most liberal scale, and I understand that the affair was most successful and enjoyable.

You will have seen from Bulletin No. 7, which has recently been published, that our Society's summer meeting at Kelowna passed off well.

The interest shown by the attendance, and by the papers given, is evidence that your Committee are wise in holding such meetings in the eastern district of the Province, and I trust we shall be able to continue them.

It is hardly necessary for me to emphasise the fact that our Society is proving the vehicle of much useful information to fruit growers and agriculturists, both by the presentation at our meetings of papers and discussions dealing with subjects of economic entomology and by the printing of such information in the Proceedings of the Society. We, as a Society, are doing our part in providing this information for reference, and it is up to the public generally to take advantage of our publications and also to attend our meetings.

In the matter of the issue of our Proceedings for the past year, we are greatly indebted to the Provincial Department of Agriculture for printing No. 7, and to the authorities of the Provincial Museum for undertaking the printing of No. 6. I think you will agree with me that the work has been done in a most admirable manner—a result extremely gratifying to the executive of our Society. It will be my pleasing duty to propose a vote of thanks to the proper quarters, but I feel that a mere vote of thanks feebly expresses our full appreciation of the benefits received.

You will, no doubt, have noticed that most of the papers given in the bulletins relate to subjects of an economic nature.

This is as it should be, for applied entomology is assuming more and more importance in the eyes of fruit growers and farmers.

The extent of damage done by insects is being increasingly recognized the more the matter is looked into. At the same time, though

there is plenty of literature covering the commonest pests and the remedies for their control, a great many people do not seem to take the trouble to read particulars of the life histories already worked out. They seem to fight shy of printed descriptions in books and pamphlets, as being too dry and technical, and very often they are too sceptical to try the remedies recommended.

The United States, which, I suppose, leads the world in the amount of money spent on combating insect pests and the publication of literature in connection with insect pests for the use and benefit of agriculturists, have, I believe, found the same difficulty in impressing the general run of farmers and of inducing them to take advantage of the information given. I have seen it stated somewhere, that the United States Entomological Department is trying to introduce the subject into the newspapers, where probably the pabulum will be taken in as a matter of daily reading. This seems to me to be an excellent plan, and worthy of being adopted in Canada or elsewhere.

While recognizing the importance of applied entomology, I would not like our Society to lose sight of the systematic side.

There is a vast amount of work to be done. I think we ought to make an effort to continue the lists given by the late Mr. Harvey in the bulletins of the Society for 1906-07-08, for the orders Coleoptera, Hymenoptera, Diptera and Odonata. It is only in the order Lepidoptera that a serious attempt at a complete list for British Columbia has been made. This list, published in 1906, has been most valuable, but it needs revising and bringing up to date.

It would be a useful work if we could collect under one cover all the records for our Province scattered through the pages of the various publications. Besides the lists I have mentioned as printed in our former bulletins, there are numerous records in the Canadian Entomologist, Reports of the Entomological Society of Ontario, etc., where they are hidden and unhandy. If we did this, the only difficulty, to my mind, would be to find someone to undertake the revisal of the records in the more obscure orders.

Considering the very little work that has been done in all the Orders other than Lepidoptera and Coleoptera, it is not creditable for the insect lovers of this Province to allow such a state of things to exist; and I sincerely trust that some of us will look beyond the amassing of a private collection of insects in comparatively popular orders and will take up the study of neglected orders, instead or in addition. It appears to be impracticable at present for the Society to think of possessing collections of its own, but at least we could publish, in handy form, information on the species of insects in the orders I have mentioned, occurring in the district. I earnestly put this matter before our members, and sincerely trust that some of us will take the matter into serious consideration.

ON THE SPECIES OF THE GENUS PERO OCCURRING IN BRITISH COLUMBIA

By E. H. Blackmore, Victoria, B.C.

For many years the species of the genus **Pero** were a puzzling one to geometrid students, and it was not until the year 1910 that the late John A. Grossbeck, of New Brunswick, N.J., revised this group and placed the different species upon a satisfactory basis.

Pero, the name by which this genus is now known, was applied by Herrich Schaeffer in the year 1850, and it supersedes the old name of **Azelina** Guenee by which it was known for so many years, and it also includes the genus **Marmarea** which was erected by Hulst in 1896. This latter was made a distinct genus owing to the fact that the male of **occidentalis** had dentate antennae.

In the species separated by Grossbeck in his revision two have dentate antennae in the males, all the others having filiform antennae. In regard to this difference in antennal structure, Grossbeck in his Monograph (Proceedings of the U.S. National Museum, Vol. 38, 1910) says: "**occidentalis** has dentate antennae in common with **colorado,** but this in my opinion can hardly be considered of generic value, especially in view of the fact that **occidentalis** in habitus and genitalic structure has strong affinities with **modestus** a species with filiform antennae, while **colorado** has affinities in the same peculiarities with **morrisonatus,** also a form with filiform antennae. For these reasons I have regarded the genus as identical with **Pero.**"

This means that the two species with dentate antennae differ more from each other than they do from those with simple antennae. The markings of this group, although similar in outline but differing in colour, are very well defined and quite distinctive. The ground colour varies from light gray and light ochreous through all their varying shades to dark umber-brown. The fore wings are divided into three transverse regions, the basal and outer thirds generally being of the same shades of colouring, while the median band is very much darker, becoming more intense as it approaches the extra-discal line. In some species the intra-discal line is partially obsolete, giving them the appearance of a single division. The hind wings are divided by a slightly curved or undulate line, which crosses the wing outward of the middle, terminating at the inner margin. Now, this concludes my generic references, but before speaking of the species with which we are most interested, I would like to say that prior to the time when Mr. Grossbeck undertook his investigations, only two species were recognized, viz.: **Honestarius** Walker (the **ancetaria** of our lists) and **occidentalis** Hulst. Mr. Grossbeck had for a long time thought that there were many forms going under the name of **honestarius,** and he set to work to gather as

much material as possible, for the purpose of studying the whole group. With his own large collection supplemented by specimens loaned from many different points in the United States and Canada, which included very long series from the collection of Dr. Wm. Barnes, he eventually examined some 800 specimens. The final result of all this work showed that there were nine different species represented on the American continent north of Mexico, five of which had been regarded, at one time or another, as varieties of **honestarius.** With typical thoroughness, Mr. Grossbeck had slides made of the genitalia, and in every case they bore out the arrangement that he had previously based on superficial characters only.

Of the nine species listed by him as occurring in North America, there are four which are found in this Province, viz.: **giganteus** Grossbeck, **occidentalis** Hulst, **morrisonatus** Hy. Edw., and **behrensarius** Pack.

I will now give a short description of each, with their habitat, which I hope will render them more easy of identification in the future. I have also brought with me specimens of the different species for comparison.

Pero giganteus Grossbeck. This is the largest species of the genus, measuring 45-51 m.m. in expanse. Its large size alone will readily distinguish it from the other species. The ground colour of the fore wings is whitish-grey, with more or less of a brownish, or yellowish, cast. The median band in the male is of a dark umber-brown, which becomes more intense as it approaches the extra-discal line. In the female this dark brown colour is replaced by a brighter reddish brown. While not a common insect, it is more abundant than any of the other species that occur in our fauna. It is on the wing from the beginning of July until the end of August, and ranges from Vancouver Island to as far east as Kaslo. This is the species that Taylor listed erroneously as **Azelina occidentalis** and is labelled as such in many of our collections.

Pero occidentalis Hulst. This species can be recognized by the dentate antennae of the male, which at once separates it from the others. It is smaller than the preceding species, being from 38-40 m.m. in expanse. The intra-discal line of the primaries is dark brown and well defined, giving the median area the appearance of a solid dark brown band, which contrasts sharply with the lighter grayish brown of the ground colour. This species is earlier on the wing than any of the others, being found throughout May and June. It is found in the Interior, and is rather uncommon. The specific localities I have for this species are Rossland, June 8th (W. H. Danby); Kaslo, June 10th (J. W. Cockle); and Okanagan Falls, May 6th (E. M. Anderson).

Pero morrisonatus Hy. Edw. This form is readily identified by its peculiarly mottled appearance. The ground colour is of a variegated yellow, the extra- and intra-discal lines being dark brown, and the

median space often profusely mottled with the same colour. This species occurs all over the southern part of British Columbia and Vancouver Island, but is more uncommon than **giganteus.** It generally flies from the beginning to the end of June. This form has been invariably sent to me under the name of **honestarius (ancetaria),** which species does not occur, as far as is known, any further west than Calgary, and must accordingly be struck off our lists.

Pero behrensarius Pack. Of this species I can say but very little, and it must be exceedingly rare, as I believe it is contained in only two collections. Mr. Grossbeck had nine specimens before him when writing his Monograph, of which seven came from Oregon, one from California, and one from Rossland, B.C. The latter was dated June 3rd, but by whom it was taken is not recorded. I had hoped to have found a specimen amongst Mr. W. H. Danby's material (he having collected at Rossland for several years), but was disappointed in this respect, although he had specimens of the other three species. Speaking of this form, Mr. Grossbeck says: "It is a very distinct and easily recognized species, separable from all the others by the granite-grey ground and the sharply defined median area."

To summarize the foregoing, the species of this genus will stand in our lists as follows:

PERO Herr-Sch.

giganteus Grossbeck - Generally distributed.
occidentalis Hulst - - Rossland; Kaslo; Okanagan Falls.
morrisonatus Hy. Edw. - Generally distributed.
behrensarius Packard - Rossland.

Author's Note.—Since the above article was written, the following additional data has been gathered:

Pero behrensarius Pack. Recently in going over a collection of Lepidoptera made by Mr. W. Downes, at Armstrong, B.C., a few years ago, I found two specimens of what are undoubtedly this species, taken in July, 1914. They agree perfectly with Grossbeck's description and are easily separable from the other three species found in this Province.

Pero occidentalis Hulst. On June 4th, 1917, I took at light a specimen of **Pero,** which seemed to me to be different to any that I had hitherto taken in Victoria. Upon examination under a binocular, it proved to my surprise to be **occidentalis.** This, to my knowledge, is the first record of this species on Vancouver Island, and considerably extends its known range in British Columbia. On June 7th, I took another one, also at light, both specimens being males.

Pero morrisonatus Hy. Edw. It is well to note that in Messrs. Barnes and McDunnough's New Check List (1917) the name **morrisonatus** has been altered to **morrisonarius.** E. H. B.

THE OCCURRENCE OF GLUTOPS SINGULARIS, BURGESS, IN BRITISH COLUMBIA

By R. C. Treherne, Field Officer, Entomological Branch,
Dominion Department of Agriculture

A single male of **Glutops singularis,** Burgess, was taken last June, 1915, at Agassiz, British Columbia, by the writer. Its identity was determined by Dr. J. M. Aldrich, La Fayette, Indiana, U.S.A., on a recent professional visit to Ottawa, Ont. Dr. Aldrich remarked at the time that it was extraordinary that an insect, apparently so rare, should have such a wide distribution. Former specimens of this species had only been taken in Massachusetts and Connecticut, U.S.A., consequently I was advised to enquire from Mr. Chas. W. Johnson, of the Boston Society of Natural History, who had been brought into touch with the insect on various occasions, regarding earlier records of its occurrence. I am indebted to Mr. Johnson for giving me the references from which the following notes are gathered.

A single male was first collected by Dr. George Dimmock, at Springfield, Mass., U.S.A., about 1872, but it was not described until 1878, when Mr. Edward Burgess placed the insect as a new species in a new genus (Proc. Boston Soc. Nat. Hist., Vol. 19, p. 322, 1878). For thirty years the above solitary male remained the sole representative of its species, and it was not until April 18, 1909, that Mr. William Reiff captured three males near Purgatory Swamp, Norwood, Mass., U.S.A. Under the heading "The Rediscovery of **Glutops singularis,** Burgess," Mr. C. W. Johnson records (Psyche, Dec., 1909, p. 132) the capture of these three males and gives the location of the types as they were placed in museum collections at that time.

On April 21, 1912, Mr. Reiff was fortunate in again taking some males at the same place as before mentioned in Norwood, Mass., U.S.A. Three years later, on April 17, 1915, at South Meriden, Connecticut, U.S.A., Mr. Harry L. Johnson captured a single male.

I am now able to record, for the past spring also, the occurrence of this fly on the Pacific Coast. This specimen is in the National Collection of the Entomological Branch, Dominion Dept. Agriculture, Ottawa, Ontario. It is very strange, therefore, that the species should be so widespread in distribution and yet be so rarely captured. Up until the present time only males of this species have been taken, consequently nothing is known of its life history or habits, but it is hoped that before long more information will be gathered on this interesting insect.

AN APPRECIATION

By A. F. Winn, President of the Ontario Entomological Society.

Mr. President and Members of the B.C. Entomological Society:

Thanks to the courtesy of your Secretary, I have the pleasure of saying a few words at this meeting.

I need scarcely say how much I wish it were possible to temporarily acquire the fabled seven-leagued boots and leave home overnight so as to be with you in person at this meeting, but even if I did, it would not be a record for a Canadian meeting of Entomologists. We were delighted to have at the November meeting both your Secretary and Mr. Tom Wilson, and felt the magnetic influence of an Entomological meeting was indeed strong to bring two enthusiasts over 2,800 miles, when in walked Mr. C. P. Lounsbury, of Pretoria, the Government Entomologist of the Union of South Africa, who also greatly helped in making the meeting the success it was.

I wish to express to you the greetings of the Parent Society, and also to say a few words of appreciation of the work you have done and are doing for Entomology in Canada. The hope has often been expressed that the time would come when our Society would have a chain of branches extending from the Atlantic to the Pacific. Today this has been accomplished, and the men who have brought it about are well known to you. One is your Secretary, who has got together such a lot of enthusiasts in your Province, that he tells me there are not enough copies of the Canadian Entomologist printed to go around; the other is Prof. Brittain, who carried the ideas he had formed in British Columbia straight across the continent, and on his arrival at Truro, Nova Scotia, at once formed an active branch in the Maritime Provinces. In Montreal, Toronto and Guelph, the branches meet regularly, and we are glad to learn that one is likely to be formed at Saskatoon.

The life history of an Entomological Society has been compared with that of an insect. It is usually started by a few kindred spirits in a very small way, making their presence noticed no more than the eggs of a butterfly, then, like a caterpillar, it begins to grow and do things; it changes its skin, adapting itself to changing conditions from time to time, it wanders abroad, it may have to rest occasionally or take refuge in dark days, and apparently not make much progress, but it is only temporarily held back, and ultimately develops its full growth. This covers a time, like the present, which may be considered to resemble the pupal period, when progress is being made rapidly, but perhaps not so noticeably, although it must be remembered that pupae are often decidedly active, and then comes the inago. What our final stage will be, remains for ourselves to show, for no other country can boast of an Entomological Society having branches extending over such a wide

area. The charter of our Society is made out on the broadest possible lines, and there is nothing Government about it, except the name, and we cannot feel grateful enough to the Ontario Department of Agriculture for having fostered us from the beginning, though they realize that they never made an investment that has paid them so well, as the annual grant they have given us.

It has been the aim of the Parent Society during all the years when the headquarters were at London, Ont., and the more recent ones at Guelph, to make the members at a distance feel they had the same privileges as those residing in their city, and many have been the suggestions and offers made to bring about closer relationships between the branches and widely separated individual members.

Glancing at the list of contributors to Vol. 47, it will be seen that out of 61 names, 20 are Canadians, a little less than one-third. Can't we do better than this, and make Vol. 48 show at least 50 per cent.? We cannot all write technical papers, fortunately perhaps, but the Editor would welcome contributions to the "popular and practical" column, and notes on capture of unusual specimens or observations of their habits.

Our forthcoming annual Report should show a series of contributions representing the whole Dominion, and we must keep this up—a few more pages can easily be added if required to publish our contribution towards the next meeting. These two publications are surely together worth the cost of membership, but to add to a good thing your Branch has outshone all the others by issuing a valuable series of "Bulletins" and distributing them to us gratis. We look forward to receiving further bulletins from time to time. They will prove more and more valuable as the series grows; and if I may suggest it, there should be a reserve stock kept somewhere, from which back numbers can be supplied at a price that will pay for the trouble and a little more. Hints have also reached us that lists of British Columbia Insects are being prepared and old ones revised, and this is another indication of the extent of your activities. One thing I omitted to mention regarding the Annual Report is the "Entomological Record," conducted by Mr. Arthur Gibson. This has been a feature since 1901, and last year's list is the largest one we have ever had. One object the late Dr. Fletcher had when he started it, was to bring us more closely in touch with one another's work, and into association of specialists capable of helping us out of difficulties.

Your Secretary not only represented you at our November meeting, but also kindly visited us in Montreal at our February monthly meeting, and told us much, but not everything, about the progress of Entomology in British Columbia, and we know he can and will tell you our side of the story, for no one could do it better. Our message therefore is not

only one of pleasure and pride in what you have accomplished, but a plea for hearty co-operation. Those of us who see our English contemporary the London "Entomologist," which is just one year older than its Canadian namesake, will recall the quotation that appears on its brilliant orange cover every month, and it can easily be memorized by all—

"By mutual confidence and mutual aid,
Great deeds are done and great discoveries made."

There is one other matter that should not be omitted, namely, that a new and stronger tie than any mentioned above is binding us closer together. Our members in every Province have answered the call of King and Country to fight side by side, as true men of science, against a power which has made science only a tool for achieving deeds of unthinkable barbarity. In numbers that have joined the colours, the British Columbia Branch stands foremost, but all will do their share. On the same day that I was reading an account of my friend Mr. H. Simms' observations of butterflies in the trenches, I was grieved to hear that the pioneer entomologist of British Columbia, Mr. R. V. Harvey, had been killed "Somewhere in France." The ancients used the word Psyche to indicate both the **butterfly** and the **soul**; and the butterfly is forever regarded as a symbol of the resurrection—a sacred thought dear to many a dying entomologist.

The enemy has recently given the press the information that science, especially in Natural History in Canada, is at a standstill owing to the war. So far as Entomology is concerned, if anyone thinks it worth while to brand this statement as being of the same nature as others that are "Made in Germany," let him look up the records of the last meetings held in Ottawa, Montreal and Victoria, and learn that they rank among the best in the 52 years of our existence.

FURTHER ADDITIONS TO THE LIST OF BRITISH COLUMBIA GEOMETRIDAE

By E. H. Blackmore, Victoria, B.C.

This paper is really an addition to the one that I read before you at the last annual meeting (Proc. B.C. Ent. Society, No. 6, N.S., p. 116, et seq.), and is induced by the fact that I have been able, during the past year, to obtain several new records to be added to our list, as well as finding out further changes in nomenclature which affect our British Columbia Geometridae. I will deal with the new records first, keeping the corrections and changes for the latter part of my paper. Altogether there are over twenty species and varieties new to our British Columbia List, which I have gathered from the following sources. In November last, while going through a number of papered specimens collected by Mr. W. H. Danby at Rossland some fifteen years ago, I found about thirty specimens of Geometridae. After relaxing and setting these up I was very pleased to find three species which had not previously been authentically recorded. At the beginning of January I was asked by the authorities at the Mount Tolmie University to re-arrange and re-label the collection of the late Capt. R. V. Harvey, who was for many years one of our most valued members. In the Geometrid portion I found three more species which were new to the list. In my paper at the last annual meeting I spoke of the captures made by Mr. E. M. Anderson at Atlin in 1914, while on a general collecting trip for the Provincial Museum. At that time several species of Geometridae were held over for investigation, and amongst them, two more have been found new to the Province. There are two from Mr. J. W. Cockle of Kaslo, as well as several others apparently undescribed, and I feel sure that there will be several more new records to his credit when they are thoroughly worked out. Amongst material collected last season at Cranbrook by Mr. C. B. Garrett for the Provincial Museum, there were a number of Geometridae, three of which are new records. A very rare variety which is new to Canada was captured by Mr. G. O. Day at Duncan, and I have been instrumental in adding eight new records, including one species and three varieties new to science.

I will now take them in order in which they appear in Dyar's List, which is at present the classification used by the leading Museums of North America. They are as follows:

Carsia paludata Thunb., taken by the late Capt. Harvey in the Hope Mountains on 19th July, 1906. This is an interesting capture, as its regular habitat is Arctic America. I have a specimen in my own collection from Labrador, with which it fully agrees.

Eupithecia laisata Streck. In the summer of 1914 I took a long series of **E. longipalpata,** and amongst them I found a short series of six

which were different to the others. At first I thought they were a well marked variety, but later they turned out to be **laisata.** Mr. L. W. Swett of Boston compared them with a specimen in the Pearsall collection at New York, which specimen was labelled "compared with Strecker's type," and my specimens matched it exactly. This species is very close to **longipalpata** but is of a lighter colour and has the spots on the veins elongated, the latter being, to my mind, its most distinguishing feature. I am inclined to believe it more of a variety of **longipalpata** than a distinct species, although that can only be proved by breeding. Its type locality is California.

Eupithecia usurpata Pearsall. This species was described in the Proc. Entomological Society of Washington, Vol. XI., 1909. It belongs to the same group as **limnata** and **olivacea,** and is in shape and colour very much like **limnata,** only it is somewhat smaller and is of an even dark yellowish brown, not mottled as in **limnata,** and the discal dots are much less clear than in the latter species. It flies with **limnata** in the same localities and is, with the latter, one of our earliest species, flying round the "sallow blossoms" in late March. I took two on the 26th March last year at Victoria, but it is almost certain to occur at Duncan and other points on the Island.

Eucymatoge vitalbata D. & S., taken by Mr. J. W. Cockle at Kaslo on the 6th August, 1907, and is the only known specimen in British Columbia. This species is taken commonly at Calgary, Alberta, by Mr. Wolley-Dod, from where it was first recorded as North American. It also occurs in Manitoba and I have specimens from Ontario.

Rheumaptera luctuata var. **obductata** Moesch. Through some misidentification of the late Mr. Taylor, he has the wrong form listed in our British Columbia Check List. The insect that he has listed there, as **R. luctuata** is in reality the var. **obductata,** which has the secondaries entirely black. I have this form from Atlin, Rossland and Vancouver.

Dysstroma mulleolata Mosch. Mention of this species was made by me at our annual meeting two years ago (See Proc. B.C. Ent. Socy., No. 4, N.S., p. 45). At that time I listed it as a variety of **Dysstroma citrata** Linn., but with additional material that I have collected during the past two seasons and a careful comparison with Hulst's type, which was made through the kindness of Mr. H. Weiss, of New Brunswick, N.J., the true form of **mulleolata** has been located. It is quite distinct from any of its allies and is of a very striking appearance; it is much larger than any of the **citrata** group, and is on the wing fully a month earlier. It is apparently local and far from being common. I may add that I have three distinct varieties of this species, descriptions of which will shortly be published in the Canadian Entomologist.

Hydriomena nubilofasciata var. **cupidata** Swett. This very rare and interesting geometer was taken by our worthy President, Mr. G.

O. Day, not far from his residence at Quamichan Lake, on the 22nd May, 1914. This variety was described in Can. Entomologist, August, 1910. Commenting on this capture, Mr. Swett says, "This is a rare variety and rather unexpected to turn up in B.C. I have only seen it from California so far, and only two specimens at that."

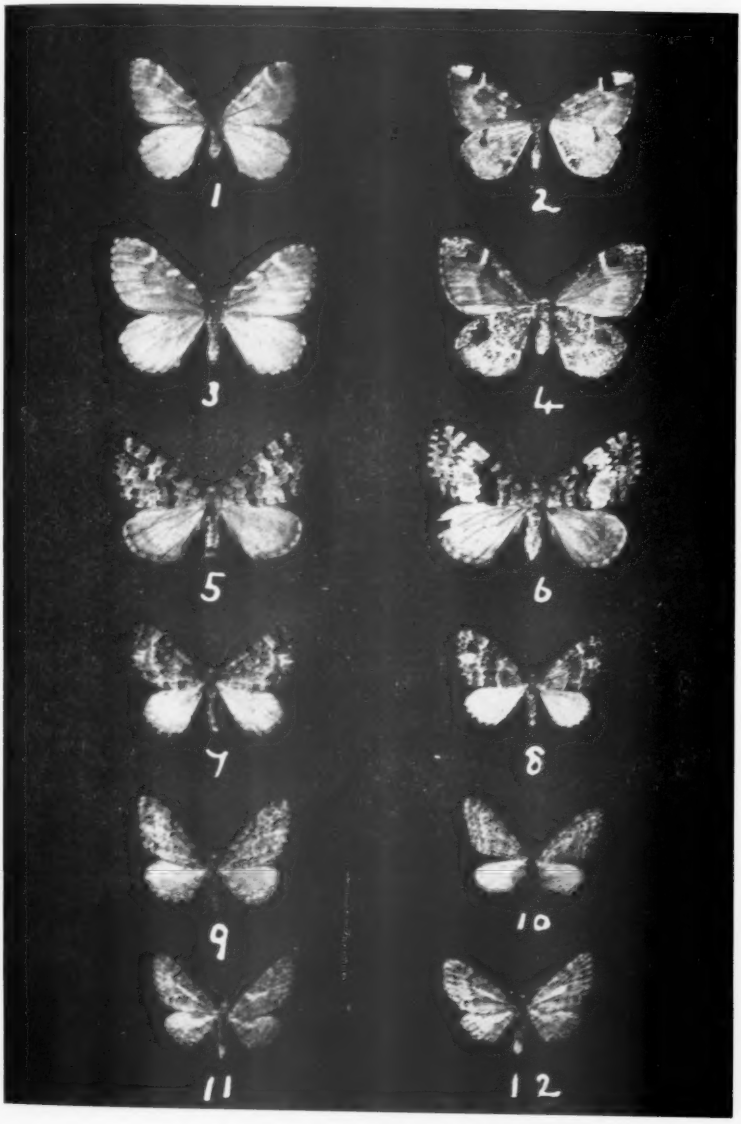
Hydriomena speciosata var. **ameliata** Swett (nov. var.) This variety has a broad white median band which easily distinguishes it from the typical form. So far I have only taken two specimens, one on the 7th July, 1914, at Garden City, and the other two days later at Swan Lake, both of them being females. The type remains in my own collection while the paratype is in the collection of Mr. L. W. Swett. It was described in the Can. Ent., February, 1915.

Hydriomena grandis var. **saawichata** Swett (nov. var.) This is a very striking variety and cannot be confused with typical **grandis,** the rusty-brown colour of the basal and outer thirds greatly contrasting with the black median band. It flies with **grandis** about the middle of May, and is on the wing about a month. It is not uncommon, although I have never taken more than two in any one day. It gets worn much quicker than **grandis,** and is hard to get in good condition; out of eighteen that I have taken in the past two years, only seven are in perfect condition. The name was originally written **saanichata,** but owing to a typographical error was printed as **saawichata,** and according to international custom I am afraid that name will have to stand.

Stamnodes blackmorei Swett (nov. sp.) This species is very local, and only occurs, as far as I know, in the vicinity of Victoria. It is a very pretty species, especially on the underside, which is suffused with a rosy flush, this being very noticeable in freshly caught specimens. It is by no means common, although it occurs regularly; I having taken twenty-two specimens in the last three years. It had gone for many years under the name of **gibbicostata** Walk., an eastern form which occurs as far west as Winnipeg. I was always doubtful about our form being conspecific with this latter, and after receiving additional specimens of the true **gibbicostata** from Montreal, Que.; London, Ont., and Cincinnati, Ohio, I noticed many differences which have led to its being described as a new species. In size it is much smaller, and underneath on the hind wings it is quite clear, where **gibbicostata** is heavily striated. It also flies a month earlier, emerging about the first week in July. I have placed paratypes of both this and the preceding one in the Provincial Museum at Victoria, and have also sent a paratype of each to the Canadian National Museum at Ottawa.

Petrophora defensaria var. **mephistaria,** Swett (nov. var.) On the 30th August, 1914, I took a very striking variety of **defensaria,** which was entirely unlike anything I had seen before. As it did not fit any published description that I had, I sent it to Mr. Swett, who, it appears,

PLATE II.



FOR EXPLANATION OF THIS PLATE SEE PAGE 20

had one sent to him some years ago by Mr. A. J. Croker of this city. These were then described under the above name. This is a very distinct variety, the basal area and the outer third being flesh-coloured, while the median band is solid black. It is rather a rare variety, as I have only taken five during the past two seasons. The descriptions of the above three geometers were published in Can. Ent., May, 1915, p. 155 et seq. I would like to add here that during the past season both Mr. Swett and myself have devoted a lot of time to the **defensaria** group, which has resulted in the addition of four more distinct varieties, all of which will be described in one of the forthcoming numbers of the Canadian Entomologist.

Leptomeris frigidaria Mosch. Several specimens of this Arctic species were taken by Mr. Anderson at Atlin in July, 1914. The markings are somewhat similar to **subfuscata** Taylor, but it is smaller in size and is of a greyish colour.

Leptomeris ancellata Hulst. Three specimens taken by Mr. C. Garrett at Cranbrook on the 6th July, 1915. It is about the same size as **quinquelinearia** Pack., but is of a chalky white colour and has more pointed wings. This is also taken by Mr. Cockle at Kaslo.

Deilinia behrensaria var. **cervinicolor** Hulst. I have two specimens from Rossland taken by Mr. Danby in 1901. This variety differs from typical specimens in having the reddish ochre colour on all wings replaced by cervinus, or deer-gray. This colour variety is very striking and rather uncommon.

Deilinia carnearia Hulst. A specimen in Mr. Cockle's collection, taken at Trail, B.C., without date. I have a note that another specimen was also taken at Peachland by, I believe, a Mr. Wallis.

Diastictis occiduaria Pack. Taken by Mr. Garrett at Cranbrook on the 20th July, 1915. Two specimens were taken and, as there has been a doubt between this and a closely allied species, I have had them compared with Packard's type of **occiduaria** by Mr. Swett, who states that they match the type exactly.

Diastictis brunneata Thunb. One specimen taken by the late Capt. Harvey at Similkameen on 20th July, 1906. This species has a wide distribution, being found in the Northern United States and Europe. I also have specimens taken at Calgary, Alberta.

Diastictis denticulodes Hulst. This was also taken by Capt. Harvey in the same locality two days later. This species bears a striking resemblance to **Sciagraphia denticulata** Grote, but is slightly larger and is easily distinguished by the bi-pectinate antennae of the male. Mr. Cockle of Kaslo has also taken this species.

Alcis imitata Walk. This geometer appears in all our local collections under the name of **A. latifasciaria** Pack., which also occurs here. In

many cases both species are mixed together under this latter name. During the last three seasons I have taken a long series of both these species and find them easily separable, the chief distinguishing feature is that in **latifasciaria** the extra-discal line on the primaries is heavily shaded with blackish-brown, whereas **imitata** is of an even colour throughout. Also the median band of **imitata** is concolorous with the rest of the wing, whilst in **latifasciaria** it is broken up and mottled with a lighter shade. They fly together in the same localities, but my notes tell me that **latifasciaria** is generally a week later in emerging and it is also much less common than **imitata.**

Metanema determinata Walk. Two specimens taken at Cranbrook by Mr. Garrett on the 12th May, 1915. Its general habitat is the North Atlantic States, but it has been taken at Calgary by Mr. Wolley Dod, although but very rarely.

Sabulodes cervinaria Pack. I have a pair in good condition, taken by Mr. Danby at Rossland on the 4th May, 1900. They have been compared with Packard's type and are correct. In the 1904 Catalogue of B.C. Lepidoptera it was listed as a doubtful species, but I found on examination that the insect with that label was a female specimen of **Pherne jubararia** Hulst.

Sabulodes auranticaria Pack. I have one from Rossland, also taken by Mr. Danby. I have a note somewhere that Mr. Taylor saw a female specimen of this species taken by Mr. Cockle at Kaslo many years ago.

This concludes the main part of my paper relating to the additions to the B.C. List, and I will now proceed to the corrections and changes in nomenclature which affect our B.C. Geometridae.

In the paper I read before you at the last Annual Meeting (Pro. Ent. Socy. B.C., No. 6, N.S.), I have to correct one error of identification, and that is **Philopsia nivigerata** Walk., which was made from a single specimen. Since then, through the kindness of Mr. G. O. Day and Mr. A. W. Hanham, I have obtained additional material, with the result that although very close, it is not **nivigerata** but is probably **tabulata** Hulst, but I will not state so positively until I have had the specimens compared with Hulst's type. We have three distinct forms of this group in British Columbia, but it has been definitely settled that **montanata** does not occur here, and therefore must be dropped from our lists. The variety **magnoliatoidata** Dyar I have from both Rossland and Kaslo. The species that I have tentatively called **tabulata** Hulst are from Victoria and Quamichan Lake, while the third form was taken by Mr. Day at Stewart, B.C., and is probably a northern form of **Philopsia canavestita** Pearsall. I hope to have this group worked out satisfactorily by our next annual meeting.

Three species of **Eupithecia** listed by Dr. Dyar from Kaslo in 1904 must be struck off our lists; his determinations were made at a great

disadvantage, as his material was very scanty and the collection in the U.S. National Museum at that time was exceedingly poor in this genus. They are as follows: **E. laquaearia** H-S., named from a single specimen, turned out to be **E. albicapitata** Pack., and the latter name must be substituted for it. This has also been taken at Cowichan Lake. **E. laricata** Freyer was also named from a single specimen in Mr. Cockle's collection, but Mr. Taylor, with more abundant material and a careful comparison with British specimens, described it as new in the Can. Ent., Dec., 1906, under the name of **E. perbrunneata.**

E. satyrata Hub. is European and should have been the **E. perfusca** of Hulst, and as both names appear in our list, **satyrata** must be struck off.

In the Trans. N.Y. Ent. Socy., 1913, p. 189, Mr. R. F. Pearsall revised the genus **Philobia**, with the result that the **enotata** of Dyar's list turns out to be **aemulataria** Walker, which is a smaller species occurring in the Eastern United States. The species that we have always listed under the name of **enotata** he has described as **ulsterata** from specimens taken in British Columbia and the Catskill Mountains, N.Y. The B.C. specimens are a trifle larger but otherwise the same. We must, therefore, revise our list accordingly.

Doctors Barnes and McDunnough in their "Contrib. Lepidoptera of North America, Vol. 2, No. 5," tell us that the names **Mesoleuca intermediata** Gue., and **M. lacustrata** Gue. have been interchanged at some time or other. Dr. McDunnough who visited Europe in the autumn of 1913, saw Guenee's type of **intermediata** in Paris, and says it is the species which is commonly known here as **lacustrata.** This is the form with white subterminal area and large discal spot. Therefore in future our present **lacustrata** will be known as **intermediata,** and vice versa. They also tell us that **Petrophora abrasaria** H.S. is typically European, and that our species should be called **congregata** Walk. In the same paper, on p. 212, they give the name of **ornata** to the summer form of **Eutrapela alciphearia** Walk. This form is much smaller and of a brighter yellow on the upper side; they both occur on Vancouver Island.

I have brought with me a case containing the majority of the species and varieties mentioned in this paper, in the hope that it may be of some interest to my fellow-members.

Before concluding, I would like to say a few words in regard to the preparation of a new Check List of B.C. Lepidoptera, to which necessity I called attention at our last Annual Meeting. As you are all probably aware, the Geometrid portion was entrusted to me for revision, and I had hoped to have had my part ready for the printer this spring. I find, however, that although I have been at work on this part for the past five months, there is still much more remaining to be done, if we are to have a thoroughly representative list. There are two main reasons why

we cannot publish a new Check List at the present time; one of them is that although the majority of the species have been worked out and correctly identified, there are still a number of species, both in the Noctuidae and Geometridae, that cannot be accurately identified until comparisons are made with the author's types; whilst others are apparently undescribed. It is of no use issuing a Check List of B.C. Lepidoptera which does not include every species known up to the date of publication, neither is it right to include a doubtful species which, with a little time and trouble, may be cleared up one way or the other. The second reason is that Doctors Barnes and McDunnough intend issuing a new Check List of North American Lepidoptera in the near future. In that work the changes in nomenclature are very considerable, and, as is very likely, that when published it will be the standard list for some years to come, it is advisable for us, as a scientific society, to have our B.C. List follow along the same up-to-date lines.

Author's Note.—Since the above notes were written, it has been found that **Sabulodes aurantiacaria** Pack. is the female of **S. cervinaria** Pack., which latter was described from two males taken by Behrens in California. Therefore, the name **aurantiacaria** will automatically become a synonym of **cervinaria.** E. H. B.

Explanation of Plate II.

Fig. 1. **Stamnodes blackmorei** Swett. Co-type.
Fig. 2. **Stamnodes blackmorei** Swett. Underside.
Fig. 3. **Stamnodes gibbicostata** Walk.
Fig. 4. **Stamnodes gibbicostata** Walk. Underside.
Note difference in size and maculatien between Figs. 2 and 4.
Fig. 5. **Hydriomena speciosata** Pack. Typical.
Fig. 6. **H. speciosata** form **ameliata** Swett. Allotype.
Note the broad white median band and strongly marked intra-discal line of this form as compared with Fig. 5.
Fig. 7. **Hydriomena grandis** Hulst. Typical.
Fig. 8. **H. grandis** form **saawichata** Swett. Paratype.
Note the solid dark median band contrasting with the lighter unicolorous basal area.
Fig. 9. **Eupithecia limnata** Pears.
Fig. 10. **Eupithecia usurpata** Pears.
Fig. 11. **Eupithecia longipalpata** Pack.
Fig. 12. **Eupithecia laisata** Streck.

Figures 3 and 4 were taken by A. F. Winn at Montreal, Que. All the others were taken by E. H. Blackmore in the vicinity of Victoria, B.C.

LARVA REARING

By G. O. Day, F.E.S.

As a subject specially applicable to both the systematic and economic phases of Entomology, I have chosen "Larva Rearing" to speak about today. Any fresh information as to the life histories of insects, either injurious or otherwise, is so much gain to both departments. I have had considerable experience in the rearing of the larvae of Lepidoptera, particularly of the English species, and perhaps a few remarks on the results of my experience may be of use.

It must be borne in mind that the larvae dealt with are Lepidoptera, but no doubt, hints can be obtained for the treatment of larvae of other orders.

The best way to obtain larvae is from eggs, either found in the natural state, or else from captured females. (Captured females may be encouraged to lay in confinement by feeding with syrup or slices of apple.) Another method is by beating the foliage of trees and shrubs over a beating tray or inverted umbrella. The most profitable times of year for this are in the spring, just after the leaves are out, and in September. The former time will catch hibernated larvae, and those recently hatched from eggs laid the previous autumn. The September beating will secure the larvae which intend to pass the winter in the pupal stage. Instead of beating, I personally prefer to search for the caterpillars by noticing where the leaves have been eaten, and by turning up leaves and branches. Searching low-growing herbage with a lantern after dark is an interesting manner of hunting, and is productive of many species not otherwise observed.

Having first procured your larvae, the next thing to be considered is the best way to feed them in confinement. You all know the kind of cages that dealers sell for this purpose. They are all very well for some kinds of larvae, but they are not suitable for all. Different species require different treatment, and it is here that success or failure comes in. I will mention several kinds of apparatus that I have found most useful myself.

In the first place, it is necessary to have small metal boxes, almost airtight, about 3 in. in diameter, glass topped preferred, to keep newly hatched larvae in. Young larvae can be kept in these, certainly until the second moult (but not too crowded), and in some cases for their whole larval existence. The advantage of closely fitting boxes is that the small larvae cannot escape and that the food does not dry up rapidly. Flower pots (all sizes), partly filled with earth or peat, or sawdust and earth, make excellent breeding cages for many kinds of low-feeding caterpillars. The top must be covered by a piece of muslin or even stronger material, tied round by a piece of string. I generally put a small bottle of water inside the flower pot, sinking it in the soil a little way,

and in this is inserted the food plant, which keeps fresh longer in this way. With larvae that feed on trees or shrubs, sleeving is a very easy way of keeping them. A number of different sized sleeves should be prepared. I have found bags about two feet long by 9 inches wide a useful size. These should be slipped over suitable branches and tied round the open end by a piece of string, care being taken to avoid folds through which larvae enemies could creep. In some cases sleeves open at both ends are more convenient to slip over branches, the outside end being afterwards tied up with a piece of string. The material of which the bags are made should be strong enough to resist the attacks of birds, but transparent enough to see when the food contained inside is getting finished. If necessary to transfer the larvae to fresh pasturage, it is advisable to cut off the old branch and pick off the larvae over a sheet or large newspaper, transferring them to the new sleeve after it is in position on the fresh branch. It is necessary to keep an eye on the sleeves and when the larvae are getting full fed, especially in cases when they pupate in soil or on the ground, to let them finish in flower pots such as I have mentioned. I prefer flower pots for this, because it is desirable to keep only one kind in each pot.

Another variant of the sleeve is to cut off a branch of the food plant required, tie it in the sleeve in the same manner as just described, only leaving about 6 inches of the stem projecting outside and then put the stem in a jar of water, with the sleeve resting on the mouth of the jar. This can be kept in the house or outhouse, and will be found a most convenient and successful method.

Shallow boxes of wood, with moss or cocoanut fibre on the bottom, make excellent cages. The tops must be perfectly level so that a sheet of glass, placed on the top, will not leave any spaces for the larvae to escape. A piece of muslin or butter cloth should be put under the glass over the top of the box. In cases of odd larvae of unknown species picked up, I have found it a convenient practice to use Economy jars or sealers. I first put a little debris, fibre moss or cotton wool, in the bottom of the jar.

Then I take a small bottle about 3 inches high, and tie a piece of string around its neck; after filling the little bottle with water, I put in a sprig of the food plant and lower the whole into the jar by the string. The string will be found necessary, for if not used the inside bottle will slip away from the food.

The string is also needed to lift out the bottle when renewing the food plant. The mouth of the jar must be covered by a piece of cheese cloth, secured by a string or elastic band. The advantage of this method is that a description of the caterpillar can be attached to the jar and the connection of larva and perfect insect be safely established. Moreover the larvae may be allowed to pupate in the jar—the jar can be stored in

a suitable situation and an eye can be kept upon it for indication of the emergence of the perfect insect, without removing the cover. In practice, however, I have found that the perfect insect often rests on the cover where it is not easily seen, so that it is advisable to take off the cover occasionally and look inside.

When breeding large numbers of the same species for varieties, I have found large tubs, or a barrel cut in two, most effective. Of course the tubs must have a cloth cover tied round by a piece of string. There are some interesting notes on the subject of breeding Lepidoptera in B.C.E.S. Bulletins No. 6 and 7 by Mr. J. W. Cockle of Kaslo. For other directions, observations, hints and recommendations, I shall quote extensively from an article on "The Rearing of Larvae" by Mr. C. Rippon, M.A., F.E.S., in "The Entomologist" during the past year, because the experiences there recorded so generally correspond with my own that I am glad to avail myself of the diction and of the writer's individual observations. I consider the article a most interesting contribution to the subject.

Newly hatched larvae have a tendency to scatter, therefore they should be confined to a somewhat small space, with the receptacle comfortably filled with the food plant, taking care that some of the food is in contact with the lid of the box, where, as a rule, the young larvae congregate. In some cases where the food plant is not known, I always put in single leaves of as many plants as are available, choosing such kinds as I think the species would be likely to feed upon in a state of nature and being guided by what I know already to be the general kind of food of the different families. For instance, a great many geometer larvae will eat **Polygonum aviculare** although that plant may not be their usual food. Likewise most noctuid larvae will eat dock, plantain or chickweed. But, in passing, I may say that any too succulent food, like chickweed or lettuce, is bad for larvae, and should be used very sparingly. Arctiid larvae prefer fairly succulent food, such as low-growing herbs. They are dirty feeders and need frequent change of food. Notodonts generally require leaves of trees. Whatever food is put in with young larvae should not be too wet and should be disturbed as little as possible. It will soon be seen if the larvae are taking to any of the leaves provided, indicated by their resting elsewhere than on the glass lid. If they congregate there or seem restless, it is best to put in fresh kinds of food. When it is seen that the larvae have eaten, they should be left alone until the food is withered, by which time the larvae have generally passed through their first instar. The food can then be examined to see which of the leaves have been preferred and the subsequent supply determined thereby. When larvae are larger, so much care need not be taken to see that the foliage is dry, except in boxes where there is very little ventilation, but such cages should be avoided, as plenty of fresh air is necessary for successful rearing. Overcrowding

is another thing to be avoided, and it is best not to have more than one kind of larva in each receptacle. "The choice and condition of pupating material most suitable to the species being bred is a matter of considerable importance. Some larvae require quite a special type of material, while the majority do best in a light, fibrous, sandy soil, more analogous to pure leaf-mould and very different to the ordinary soil in a garden. Then again, for convenience in manipulation, the material should have nothing in it which could be mistaken for a cocoon, i.e., no lumps, stones, etc.; it should also be easily capable of being moistened to any degree required, and, most important of all, should be free of any insect pests.

I quote the foregoing information about the moistening the pupating material, for the use of anyone it may appeal to. My own experience is that, as a rule, if pupa are kept in the open air, under cover and shade, they do not require artificial moistening. I think, however, that if pupae are found in a damp situation, it is important that the moist condition should be continued, as it is fatal to allow the same pupae to be sometimes damp and sometimes dry.

In regard to "receptacles for pupating, it may be mentioned that, though metal may be used, those constructed of rough wood are infinitely preferable, except for wood-eating larvae and one or two species which seem to like stone or earthenware to pupate on.

"The size and depth of the receptacles are again dependent largely on the species to be treated. About three or four inches deep are sufficient for the majority of burying larvae, but for some of the larger hawk moths and certain fastidious things, the compost should be much deeper. As to size of receptacle, it is much better to have a number fairly small and let only a few larvae do down in each, than one large one, and expect a lot of larvae to go down in it.

"One reason is that generally the majority of a batch of larvae unaccountably prefer one end or corner of a pupating box; consequently if a large number are allowed to pupate in the same box, however large it may be, those which descend last will disturb those already down, with bad results as to the number of pupae obtained.

"For larvae which spin up on the surface of the ground there is nothing equal to natural moss (sterilized), pressed down gently on to the surface of a layer of the peaty compost already described.

"For those which spin up in dead leaves, it is obvious what should be supplied, while larvae which spin above ground usually do not require anything special, but will make their cocoons on the food plant or cage. Ornamental cork is not a bad substitute for such larvae as require the bark of trees in which to make their cocoons, while wood-feeders and a few others demand special treatment, such as hollow sticks, rotten wood, and the like."

"All breeders of Lepidoptera naturally aim not only at obtaining a high proportion of imagines to the number of larvae, but also at obtaining fine, richly coloured specimens. No doubt a large variety of factors conduce to the production of such imagines, but one of the greatest is, I believe, quickness of development in the larval stage. Of course the average life of larvae of different species varies enormously, some taking years to come to maturity and others weeks only; so that in speaking of quickness of development I only mean it to refer to the usual length of life of the larva under consideration. Suppose for example, we have a larva whose average life is 3 months; it will usually produce a far finer imago if it comes to maturity in ten weeks, than if it drags on for three and a half months. Other things being equal, the quicker, within certain limits, larvae can be fed up without interferring materially with their cycles, the larger will be the proportion to pupate and the finer the resulting imagines. This I have found to be particularly the case with larvae that feed up in the spring or early summer.

"Now if there is one thing that has more influence than another on quickness of development, it is temperature. I do not mean that the greater the heat the better will be the results. The temperature wants to be consistent with that prevailing under the best conditions at the time of year when the larvae naturally feed, and, above all, it should be regular. I have frequently obtained quite remarkable results by feeding up certain spring larvae in a temperature of 55 to 60 degrees kept up regularly day and night in April and May.

"This sort of treatment has one disadvantage, and that is, that the imagines may appear two or three weeks before their proper time; but against this may be set very many advantages. The larvae seem very much less liable to ailments; they feed heartily and steadily, there is practically no loss in changing skins or pupation, and the imagines are large and handsome. I have found this use of a steady, fairly warm temperature of the greatest help in rearing larvae hatched in the spring from ova which were laid the previous summer or autumn, and have by its means bred without any difficulty several species which pass the winter as ova and are considered difficult, if not impossible, to get through successfully in confinement.

"Perhaps this effect of a regular temperature is one of the chief reasons why some species vary so enormously in their abundance in different years. If the temperature during the months the larvae are feeding is unusually warm and steady for that period of the year, then the next emergence of the species will be unusually abundant. It will be noticed that I refer to the temperature being warm, not hot. Great heat and drought have quite a contrary effect; the larvae may feed up very quickly, but the imagines are frequently small and stunted. This may very likely be due to the fact that great heat dries up foliage and makes it much less succulent, besides making it more difficult for the

larvae to eat, so that the latter cannot consume enough to keep pace with their rate of development; and what they do consume has very little moisture in it—a commodity most essential to a larva's well-being.

"The successful hibernation of larvae is, in my opinion, the most difficult part of larvae rearing.

"The majority of hibernating larvae require to be on or near their food plant to live through the winter, and there is little doubt that many larvae feed far more during hibernation than many persons suppose. Low-feeding larvae may be successfully treated in a cage in which is placed a flower pot planted with what they feed on. I would, however, suggest that whatever the plants may be that the larvae fancy, a little grass should also be put in the pot, for I have found that quite a number of species which never touch grass at other times will frequently nibble it during the winter months.

"Quite a number of species which hibernate as larvae in nature can be made in confinement to feed straight up, pupate and emerge about Christmas or early in the new year. The two necessary factors are warmth and suitable food. . . . . A suitable temperature is, of course, all-important, and it should on no account be allowed to drop very low even for a short period. One really cold night will start some larvae hibernating, and nothing will then induce them to resume feeding. This forcing through of hibernating larvae is only possible with certain species; others, whether kept warm or not, utterly refuse to go on feeding after a certain period in the autumn. With many hibernating larvae it is not particularly difficult to bring them through the winter; but the problem is how to prevent them dying off when hibernation is over, which they often persist in doing, despite being supplied with the most tempting portions of their food plant. When the latter is available sufficiently early, I have found that the best plan is to bring the larvae into a warm, steady temperature about a month or more before they thoroughly wake up under natural conditions. I often begin to bring in hibernating larvae in February, with most excellent results."

"I have seen it stated in quite a number of works on the British Lepidoptera that the pupae of burying larvae should not be dug up, and that cocoons should not be interfered with. In the great majority of cases I would unhesitatingly advise the very opposite.

"In confinement many of the spinning larvae will make their cocoons one on top of the other in such a way that if left in position the imagines could never get out of those at the bottom, while with those that bury I have already pointed out how one end or corner of the pupating box will be patronized by the majority of the larvae. Then, again, despite the greatest care, insect pests may get established in the pupating material; and if the pupae are left in it for months they may all be destroyed long before the perfect insects are ready to emerge. Another

point about taking out the pupae is that they are then much easier to handle and look after and to place, so that they get the full benefit of the damp atmosphere which is so necessary to most species just before emergence. When, in addition to this, it is realized that the removal of the pupae, if carefully done, does them no harm, and adds to the percentage of emergences, there seems no tangible reason for leaving pupae in situ.

"I do not by all this mean that every cocoon should be opened and the pupae removed. As long as the cocoons are fairly substantial there is no object to be gained by doing more than separating the cocoons one from the other, and removing the loose outer web if there is one. Indeed, from the difficulty of doing so without injury, it is unwise to attempt to remove pupae from tough cocoons."

"When dealing with larvae whose period of rest is unknown, the receptacle in which they have gone down should be left untouched for a fortnight, then the compost in one corner should be gently removed till one of the insects is found; if it is a thoroughly hard pupa, the lot may be turned out with safety; if, on the other hand it is still a larva, leave it, slightly exposed if possible, so that it can be inspected every few days. In this way the period of rest can be found out, and, at any rate, the breeder does not endanger the whole brood. The chief thing in keeping bare pupae over any length of time is to prevent them coming into contact with anything that will block up their spiracles. They should never be allowed to lie on, or in any dusty material, such as dry earth. Bare pupae and cocoons can quite easily be kept during the winter piled into and shut up in chip or glass-topped boxes exposed to outdoor temperature."

"About a month or more before the time arrives for the emergence of the perfect insect, the pupae and cocoons should be spread out in shallow pans or boxes, the bare pupae between two layers of sterilized moss, and placed in a cage or large, well ventilated box with rough sides and top. The atmosphere in this box should be kept decidedly damp, or many cripples will be bred, especially amongst the Geometers. The pupae of many species do not all emerge the first year, a provision of Nature that has no doubt saved many an insect from extinction; but this class of pupae does not seem to call for any special treatment, unless it be extra care in making sure a pupa is really dead before throwing it away."

That is all I have to say about larvae-rearing today. I am conscious that all the members present may not feel greatly interested in the subject, and may think that I might have chosen a less commonplace one, but my excuse must be that I wish to encourage the practice of larva-rearing; for it is a sad fact that in the case of a great number of our insects, little or nothing is known of their earlier stages.

In Memoriam

CAPTAIN R. V. HARVEY

Captain R. V. Harvey was born at Londonderry, Ireland, in 1872. His earlier education was received at Liverpool College. From this institution he matriculated into Magdalen College, Cambridge, where he graduated as a Master of Arts.

Coming to Vancouver in 1900, he opened the Queen's School, a private academy for boys. Under his able direction this institution grew to such dimensions that it was found advisable to transplant it to Victoria, where a more suitable environment could be found. He there co-operated with the Rev. W. W. Bolton and Mr. J. C. Barnacle in the establishment of the University School.

During the nine years that Captain Harvey spent in Vancouver, he was indefatigable in his efforts to promote the interests of Entomology in this Province. It was largely due to his efforts that the B. C. Entomological Society was inaugurated in 1902. For nine years he was Secretary of that Society, and was tireless in his endeavours to make it a success.

Captain Harvey had studied the Lepidoptera in England, where he had made an extensive collection. He naturally specialized in this order when he first collected in British Columbia, and many new records and several new species were added to our lists as the result of his work.

In 1904 he turned his attention to the study of Diptera, and during the next four years his collections in this order were extensive and valuable. In the Canadian Entomologist for January, 1908, Prof. Raymond C. Osburn, in his article on B.C. Syrphidae, says: "Especial reference must be made to the excellent work of Prof. R. V. Harvey, of Queen's School, Vancouver, to whose careful collecting twenty-two of the additions are due."

In 1906 Captain Harvey made a collecting trip over the Hope Trail to Princeton, walking one hundred and thirty miles. The results were so satisfactory that he repeated the trip in 1908. This, perhaps, marks the last serious work he attempted in connection with Entomology. Botany began to appeal to him as a new field of study; and with characteristic thoroughness he set about the investigation of our western flora. On his return from the first Hope Trail trip he started the Vancouver Naturalists' Field Club, an institution which flourished during the time he was connected with it, but which, on his removal to Victoria, became moribund for want of a guiding spirit.

But other fields of effort now claimed his attention. From the very inception of the Boy Scout movement he became one of its most enthusiastic supporters. The Cadet Corps of University School, Victoria, also found in him its able sponsor.

It is not surprising to find him associating himself in a more serious way with military affairs. With the establishment of the 88th Fusiliers, Captain Harvey took out his commission. His first taste of active service was during the mining disturbances on Vancouver Island. Then came the declaration of war, and Captain Harvey was one of the first to offer his services.

He was drafted with the 7th Battalion and after training at Valcartier and later at Salisbury Plain, was with the first Canadian forces to go to France. Here he was wounded and taken prisoner in the gallant charge of the Canadians during April, 1915, and died in a German concentration camp some few weeks later.

The news of his death brought heartfelt sorrow to all who knew him. His personality was magnetic in its power to attract and charm those who were in any way intimately associated with him. The versatility of his mind was so combined with a singleness of purpose and concentration of effort in whatever he undertook that we find him excelling in many of life's activities. During his residence in the West he made many friends, who will long mourn his loss, and yet who will feel a certain vicarious pride in the heroic nature of his death.

R. S. SHERMAN.